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# THE VETERINARIAN,

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OCTOBER, 1892.

EDITED BY

PROFESSORS SIMONDS, BROWN, AXE AND McCALL.

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# VETERINARIAN.

VOL. LXV. No. 778. OCTOBER, 1892. Fourth Series. No. 454.

## Communications and Cases.

### INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

#### Section III.

#### THE RELATION OF DISEASES OF ANIMALS TO THOSE OF MAN.

#### VETERINARY HYGIENE.

By Fred Smith, M.R.C.V.S., F.I.C., Professor in the Army Veterinary School, Aldershot.

(*Continued from p.* 586.)

The carbonic acid in the air of stables is, with care, a perfect index to the respiratory purity of the atmosphere. The care which, in the case of stables, has to be exercised in selecting a sample of air for the determination of $CO_2$, is to take it at least six feet from the ground, otherwise the presence of ammonia arising from the decomposition of urea affects the analysis by Pettenkofer's method.

From over 250 analyses of stable air I obtained some interesting results. 1. The purity of the air depended upon the type of stable; where ridge or louvre ventilation existed in the roof the air was comparatively pure, the changes being frequent. 2. In those stables which had dwelling-rooms and lofts over them the atmosphere was generally foul, assisted also by the fact that in this class of stable windows are few and far between.

The above experiments showed that Professor de Chau-

mont's number for permissible organic impurity ·2 of $CO_2$ per 1000 vols. of air holds good for stables. During this inquiry some very considerable quantities of $CO_2$ were found, 2·65 per 1000 being the largest. Leblanc found in a stable in the École Militaire ·7 per cent. $CO_2$, and 20·39 per cent. O. Such impurity as this I have never met with.

Ammonia is largely met with in stable air, arising from the decomposition of urea.

The diseases produced, aggravated, or spread by impure air are very numerous. We shall have to show, under the head of dietetics, that the majority of preventible diseases amongst animals are traceable to food and feeding, but certainly next to this will come impure air. There is no error which gives us greater trouble to rectify in the public mind than the common one that all windows and doors must be shut if horses are to keep in health ; to such an extent is this carried, that not only are doors and windows closed,but every other means of inlet and outlet, and in days gone by even the key-hole was not forgotten. The state of this atmosphere defies description, the pungent ammoniacal vapours bring tears to the eyes, the insufferable odour produces a feeling of nausea and faintness, and in such places as these horses and cattle languish. Is it any wonder that glanders and farcy are so common in all our big cities, that pneumonia is so fatal, and blood diseases such as purpura only too frequent. The production of these is aggravated by the unhealthy condition of the atmosphere in which these animals exist. Before ventilation of stables was established in the army through the intervention of Professor Coleman, we have it placed on record that hundreds of animals died yearly from chest diseases and glanders and farcy; by the introduction of a proper system of ventilation this in course of time was completely stamped out, so much so that many of us have not seen a case of glanders for years, and though we have not entirely lost sight of pneumonia, yet cases are not so severe as they were, and are consequently more amenable to treatment. It is impossible to deny that these results have been obtained through thorough ventilation and good stable management.

Much yet requires to be done in this direction in civil life, the prejudice to be overcome is immense; buildings for horses and cattle in big towns and cities in particular require that a thorough system of ventilation should be instituted, and we can only hope to establish this by instructing the public in the laws of health.

If it be possible to erase from the Government returns

such diseases as glanders, it is equally possible in civil life. I have alluded to the mortality among the French cavalry previous to sanitary science being adopted by them. The admissions for glanders fell from 23·32 per 1000 in 1847–52, to 7·24 per 1000 in 1862–6, and during the same period non-specific diseases of the lungs and pleura fell from 104·7 per 1000 to 3·59 per 1000. The only conditions present to account for this remarkable change were increased facilities for ventilation and larger cubic space.

Coleman, who did for veterinary hygiene at the early part of this century what Chadwick and Parkes did for human hygiene some years later, held the view that glanders could be generated by the foul atmosphere of stables, and he quoted, amongst other examples, the fact that if horses on board a ship were battened down during heavy weather, that glanders occurred amongst them in consequence. It was with this view of the poisoned atmosphere of the stable which laid the foundation of veterinary hygiene in this country. Whether the view is tenable or untenable in the present light of science this is not a fit place to discuss, but it is an excellent working hypothesis, and has been the means of ridding the army of glanders.

Another disease which has nearly disappeared is specific ophthalmia of the horse, a disease which has no prototype in the human subject, but which steadily though surely leads, by repeated attacks, to entire loss of vision. Foul atmosphere and putrid ammoniacal vapours were blamed as the cause of it, and the disease has certainly become so rare since ventilation and drainage were adopted, that in the army a case is very rarely seen.

A disease, called in France stable fever (analogous to hospital and prison fever in man) existed in stables abroad as the result of a foul atmosphere, and in such places wounds rapidly became putrid and produced pyæmia.

Apart from diseases of a specific kind, animals kept in badly ventilated buildings are very susceptible of cold, they require more food for the amount of work performed, and colds and coughs are frequent amongst them.

A consideration of air leads us up to the important question of *Ventilation*. This is principally carried out by natural means, though there is no reason why, say in the case of milch cows (where too free natural ventilation would unduly lessen the temperature), artificial ventilation should not be adopted, in fact, it would probably have to be in winter-time, if the animals were to receive the amount of fresh air they needed.

The points we have to bear in mind are these:—1. It is a simple matter to ventilate a building with an open roof, viz. one with no rooms or loft overhead, but where closed roof stables exist with but few windows, and those often badly arranged, ventilation becomes nearly impossible. 2. No stable or building for animals can be effectively ventilated by natural means where the width of the building exceeds thirty to thirty-five feet. Windows opposite to each other should exist on both sides of the building, between these windows not more than two animals should be placed. The old idea of having windows only at one side of the stable or only at the ends of the building, with perhaps eight, ten, or more animals between opposite sources of air is the worst method which could be devised.

*Food.*—The complicated apparatus essential to the digestion of vegetable food exposes the possessor to a very large number of diseases unknown to omnivora. Besides those disorders attributable directly to food and feeding, we have many others only attributable indirectly to this cause, and yet the sum of these presents an astonishing total.

It is when we come to consider food and feeding as a branch of hygiene that for the first and only time we cannot lay down one set of laws applicable to all animals, for the reason that each class is fed on a different principle, due to the arrangement of the viscera. Nothing can be more different than the feeding of horses and cattle, or sheep and pigs, yet all these animals, by means of their wonderful digestive laboratory, are capable of converting vegetable into animal tissue. To give some idea of how vastly these animals differ in the arrangement of their digestive tract, I may say that of every 100 parts of gastro-intestinal canal, the stomach in the horse is represented by eight parts, in the ox by seventy parts, in the sheep by sixty-six parts, and in the pig by twenty-nine parts.

Animals are fed either for work or for food. In either case the principle of giving sufficient to supply daily wear and tear is obvious; horses cannot work, nor cattle fatten, nor sheep thrive on a poor or illiberal diet.

There is, perhaps, no branch of hygiene more under our control than food and feeding; the public know very little about it, and so many preventible diseases are attributable to this cause that it is clear some elementary instruction should be given to horse and stock owners.

The diseases are due to either alterations in quantity, quality, or conditions of digestibility and assimilation.

Amongst the wealthy class of horse-owners the tendency

is to cram animals with food, leading to deposits of fat on the body, often rendering even light work a matter of considerable difficulty; this is particularly the case with carriage horses. With hacks and hunters the matter is different, the amount of work performed being equal to the amount of food given, very little is stored up in the system. An excess of food leads to diarrhœa and other disturbances, the undigested food undergoing certain changes in the bowels probably with the development of leucomaines, and not unfrequently giving rise to liver disturbance as well as bowel irritation.

A large quantity of nutriment being poured into the blood leads to changes in that fluid, especially if the animal has for some time previously been on a poor and innutritious diet. Symptomatic anthrax in cattle is attributed to this cause in England, and in India the fattest horses are invariably the victims of the virulent anthrax of that country. Excess of food leads to liver changes, inflammation of the lymphatic vessels of the limbs in horses, paralysis of the stomach, gastric apoplexy, colic, and inflammation in the feet. In cattle, gorging of the stomach, tympany, and impaction of the stomach, and other disorders are directly attributed to excess of food, particularly of a special kind, tympany, for instance, to excess of green food, the same cause producing tympany in the horse.

With a deficiency in food, certain marked physical changes occur in the organism accompanied by diseases which we regard as due to neglect. Scabies, glanders, farcy, and dysentery occur to horses exposed to privation and severe work, such, for instance, as occurs to animals in war. Hæmoalbuminuria and moor-ill in cattle are attributed to a deficiency in food. With a deficiency in saline matter, rickets and other diseases of nutrition follow; with a deficiency in albuminoids there is loss of energy, and with a decrease in digestible and increase in indigestible matter there is a general loss of muscular development and pendulous abdomen. We have before noted the importance of very gradually bringing animals which have been living on comparatively poor food on to diet containing more nourishment than that which they have been used to.

Diseases associated with the digestion and assimilation of food are exceedingly numerous. There are some grains which if given to animals act like poisons. Wheat, for example, will produce tympany in both horses, cattle, and sheep; maize has been blamed for producing bowel and skin diseases, and in the horse laminitis; softening of the liver of

horses in Egypt has been said to be due to a kind of clover. Potatoes purge horses, buckwheat has been said to produce cerebral derangement, and parsnips to affect the eyes. Laryngeal paralysis in horses has been traced to the use of certain Indian vetches, and acorns have been known, in certain years, to be exceedingly fatal to pigs, probably due to their astringency. Eczematous skin disease, common amongst horses in India, is due to feeding on wet grass.

Conditions affecting the quality of food is a very important question to the veterinary hygienist; it embraces the growth and preservation of the plant, the nature of the soil on which it is grown, and a variety of animal and vegetable parasites which infect it.

The quality of the soil materially affects the nutritive properties of the grass and grain grown on it; the time of preservation and the nature of the weather influences the feeding value of hay and grains; the weather also seriously affects the preservation of food, wet and damp inducing the growth of vegetable parasites, which not only render the food useless as forage, but in some cases actually poisonous. In this connection we consider bunt, rust, mildew, smut, and ergot, which affect the plant during its life, and the mucors and penicillium which generally affect it after its death; we have no direct evidence as to the invariable harm produced in the system by these parasites, though we are all agreed that they are prejudicial to animals, and that in many cases they may produce diabetes, nephritis, paralysis, inflammation of the bowels, and cerebral symptoms.

The quality of food is also affected by its age; new hay produces diarrhœa and is innutritious; new oats cause purging and stomach irritation. By keeping, these harmful properties are got rid of.

Cleanliness of food is an important condition of quality; dirt finding its way into the intestinal canal is liable to accumulate and produce considerable irritation and death. Calculi have also been supposed to be produced by the same cause, though it is possible that in these cases their only effect is to act as nuclei for the deposition of the mineral matter in the food.

The preparation of food affects its digestibility. Old horses with defective teeth need their corn to be crushed, and corn-crushing, even for horses with perfect teeth, facilitates digestion; cattle should have their roots sliced or pulped to prevent choking, maize and barley, beans and peas should be crushed; some grains used for feeding in India require to be boiled, and boiled foods are often used

for fattening horses in this country. Boiling food is a serious error, and fraught with danger to horses, it is a prolific source of stomach and intestinal disorder, partly, perhaps, from its soft nature not producing stomachic peristalsis, but largely from the fact that boiled foods are "bolted" without being masticated.

Food is also affected by the presence in it of poisonous plants, and cattle and sheep poisoning from this cause is common, but we have said enough to show the importance of care and attention to food and feeding, and the enormous influence this presents in the preservation of health. When an outbreak of disease of a non-specific character occurs amongst animals, the food, its quality, nature, &c., is naturally, and must ever be, the first question we inquire into.

*Stables.*—The large majority of buildings existing in towns and cities as stables and cowhouses, &c., are not worthy of the name. The London cab stable is typical of the class, low, dark, oppressively close and muggy, flooring bad, no drainage, atmosphere reeking with ammoniacal vapours, which to a new-comer irritate the conjunctiva beyond conception; the whole place tumbling to pieces, doors patched up with sacking, windows in a similar state, or filled in with straw, soiled and foul bedding lying everywhere, and the level of the stable floor not uncommonly below the level of the surrounding soil. Amongst the better classes we gradually find these structural defects remedied, but the absence of doors and windows in sufficient number for lighting and ventilating purposes is very marked. It is only amongst some large companies and in the army, that stables constructed on a sanitary plan exist, and to these we will presently refer.

Cow-sheds in cities and towns are much more under control than stables; the watchful eye of the medical officer of health ensures at least the elements of sanitation being observed, but much yet remains to be done in construction, lighting, flooring, ventilation, drainage, and heating, before we can consider that milch cows are placed under healthy conditions.

The principles of construction are very clear, use virgin soil where possible, avoid made ground, low-lying places, or soil in which the ground water is high. It is not much use suggesting a deep gravel where such is not the natural geological formation, but such a site is preferable to any other.

Let the walls be double to ensure dryness, the foundation

and flooring of concrete to avoid the permeation of urine and fluid fæces, the width of the building not to exceed thirty feet, the animals to be arranged with their heads to the outside walls, with a passage down the centre; a large sheringham window over the head of each animal, doors at either end, the roof open, viz. no rooms overhead, with louvre ventilation on the ridge. The fittings to be of iron, plain and strong, the brick flooring which is placed over the concrete to be well set, not slippery, durable, impervious, readily cleaned; the drainage everywhere inside the building to be surface gutters, a very shallow one from each standing running into a wider one which runs at the rear of the stalls the whole length of the stable. Ample water-supply for flushing stalls, boxes, and drains; no traps or gullies inside the building, and the walls, as high as the animal can reach, to be of cement. The cubic capacity per head should be 1600 feet, and the superficial area of the stall 70 feet, and with share of central passage, 100 feet. Such are the principles on which the most approved type of stable should be built.

The objection to the cubic contents named is that the building would be cold; where this objection holds good there is no reason why artificial warming should not be practised by means of a gas bracket at certain inlets, the products of combustion being carried off from the building, or hot water pipes may be used. The present practice of raising the temperature of the building by the heat radiated from the body and the heated expired air is obviously highly insanitary.

The surroundings of the stable or cowhouse need attention, dung-pits, uncleaned drains, &c., should be looked to; pits intended for manure should not be nearer than thirteen yards to a stable. How often do we not find them placed close to or under the window, the poisonous vapour passing into the building? Care should also be observed not to crowd buildings too close together, and the nearest that one block should approach another is twice the height of the nearest building. Blocks built in the form of a square are bad, especially if close together, the obstruction to free natural ventilation being very great.

In dairies, special provision must be made for rooms for storing the milk, which should be quite distant from the cow-shed or any human habitation.

All drains should be properly trapped, and if subsoil drainage is introduced into the building all traps should be ventilated, and thus cut off from the sewer.

It may not be possible, owing to the expense of construction and other causes, for private individuals to afford their animals such sanitary dwellings as we have described, but an endeavour should be made to work as near to it as possible.

All receptacles for excreta should be cemented, and the same remark applies to cowhouses for the place where "grains" are stored.

The removal of excreta is an important matter; we are liable to forget that one of the chief causes of air impurity in stables and similar buildings is owing to the presence of fæces and urine, and if for no other reason than this ample ventilation is required. By the use of surface drains the most effectual and sanitary drainage inside the stable is accomplished, and none other should ever be used.

The part played by *Soils* in the production of disease is far from clear; we do certainly know that a high-ground water is dangerous to health, that marshes are prolific of sheep-rot and anthrax, and that alluvial soils with dense marls and clays are, especially in the tropics, notoriously unhealthy; but how far such diseases as tuberculosis, glanders, &c., are affected by a polluted soil, we have at present no information. My own impression is that in course of time it will be shown that soils do play a very important part in the production of disease; the whole question needs to be thoroughly investigated, especially in the tropics.

The nature, character, and conditions under which animals perform *work* is a question which offers the fullest possible scope for hygienic interference. In this country horses are the chief animals used for the purpose of work, but abroad, and with armies in the field, mules, bullocks, elephants, camels, &c., are severally employed, and require considerable attention.

The nature of the work comprises riding, draught, and pack. In the former the fitting of saddlery and the prevention of sore backs is a subject on which much might be written; we must here only content ourselves by saying that the question until recently has never been scientifically studied, the result being the production of immense injury and loss. We now know that saddle-fitting can only be properly carried out when anatomy and the laws of physiology are brought to bear in showing what part of the back is capable of bearing weight and what parts are not, and in demonstrating the absolute necessity of the saddle conforming to the shape of the horse, and the advantage of dis-

tributing the weight over a large rather than a small surface.

The ultimate result of employing these simple rules will mean, to the army in particular, an immense saving of life and suffering in the future.

With pack animals much the same considerations in saddle-fitting apply as to riding-horses.

With draught, a great deal needs yet to be done; the best form of vehicle suited to different roads, size of wheels, angle or traction, fitting of collars and other portions of harness, and the relative advantage of shaft *versus* pole draught, are all points influencing considerably not only the value of the work performed, but the comfort and health of the animals called upon to perform it.

The streets of every big city demonstrate daily the necessity of inquiring into this question of draught; horses are compelled to perform their work under unnatural conditions, defective shoeing, slippery roads, and other factors which tend to exhaust their strength and wear them out long before their time.

The regulation of the amount of work to be performed can only be observed where the public is instructed and capable of understanding the elementary fact that a horse is not a machine, and that his muscles need rest and time for repair as well as our own. It is perhaps on points of this kind that hygiene may have the least influence; cupidity is strong. Fortunately we are a horse-loving race, and the feelings of the noble animal appear to directly appeal to our senses; but in other countries such does not appear to be the case. The operations of the law give horses a certain amount of protection in respect of the question of overwork, but it is probable that in cities the major part of this cruelty is inflicted at night-time.

### *Individual Hygiene.*

Many points of the greatest importance have to be considered under this head, such as stable management, bedding, grooming, clothing, clipping, shoeing, &c.

A good bed for horses is essential; if they lie warm and comfortable it is equivalent to extra food, the limbs are rested, and the horse refreshed. The bedding should receive careful attention in the morning, the whole of it being removed from the stable and the soiled portions replaced; the portion of litter kept should be dried in the sun if possible, but under all circumstances thoroughly aired and ventilated.

The common practice of not removing the bedding from the stable, or turning it under the manger during the day, cannot be too strongly condemned; it is possible under these circumstances to keep the air of the stable sweet, owing to the amount of ammonia and foul vapour given off from the decomposing litter.

It is considered by some that horses should be bedded down during the day, as it saves the feet; certainly horses like bedding under their feet, but I am not prepared to say that such is essential.

The use of moss litter and sawdust as bedding, with the object of absorbing the urine, is very good if the absorbent material be kept clean; where soiled bedding is allowed to remain the feet are destroyed by being soaked in the alkaline mass produced by the decomposing urine.

In *Grooming*, two objects are aimed at, viz. a clean skin and a glossy coat; a brush suffices for the former; the natural sebaceous secretion which gives the latter is excited by wisping. Grooming is an art which can only be learned by long training; its theory is simple, its application difficult. Washing horses is a pernicious and dangerous practice—dangerous for the reason that they are always left to dry themselves—pernicious because it removes the natural grease from the skin, induces cold, and causes the coat to become dull. A horse covered with dirt should be scraped, the body dried and clothed; if not wet, but simply muddy, the latter should be allowed to dry and then brushed out. Washing legs in winter produces intense erythema of the heels, sometimes reaching as high as the knees and hocks; it is due to using hot water, and not drying the parts.

The skin of the limbs also suffers from the application of salt to the roads in times of snow, the low temperature produced by snow and ice causing the parts to become frozen.

Thus we find the skin suffers from want of grooming, and the limbs from washing and other causes; the amount of damage the latter produces in large cities in the winter can hardly be imagined. Scabies shows itself through neglect in body cleanliness, the disease in the horse spreads with surprising rapidity, and nothing but prompt action can effectually arrest it. I am not clear how far dirt alone produces the disease, or rather affords it a nidus for its existence. I have seen bodies of horses systematically neglected in respect of grooming keep free from scabies, and I have known it to occur where the best stable management existed; in this case the disease was imported. When, however, we combine

dirt with poverty and starvation, at once the disease breaks out in its most virulent form, and in this state is the scourge of armies in the field.

It is a recognised fact that horses living constantly in the open require very little grooming, as it exposes them to cold and skin irritation. The surface of the body should simply be wisped, but both mane and tail require thorough brushing out.

The amount of clothing required by horses depends entirely on the length of the coat and the ventilation of the stable. In cold stables they require more food to keep them in condition, and extra clothing saves this to some extent. On the other hand, the wearing of three or four blankets in the winter is a mistake, as the coat grows thin and fine, and the sudden change from, perhaps, a hot stable to a piercing easterly wind is the explanation of most of our cases of chest disease. Army horses receive no clothing, no matter how severe the winter, unless they are living in the open. This should be sufficient evidence on a large scale of the comparative immunity of the horse against cold.

*Clipping.*—The extra growth of hair during the winter causes, with hard-worked horses, continual sweating during work, and in this state more harm is done than it is possible to conceive. Horses with wet skins are left standing in the streets, instead of being quietly walked about, and to this a very large proportion of our cases of pneumonia and pleurisy are attributable. We recognise as a practical fact that if horses are performing severe work in the winter the long coat must be removed, and artificial covering take its place in the stable.

There are certain skin diseases of the legs attributable to long hair, affecting especially the heavier or common breeds. Long hair on the limbs acts as a nidus for dirt, as, being coarse and stiff, it is difficult to clean. This, no doubt, is one of the explanations of "grease" in the horse. The abundance of hair grown on the limbs, and so much prized by breeders, is a source of danger, and is no indication of strength, as is commonly supposed.

The *Shoeing* of horses is a most important practical side of veterinary hygiene. Though the most intelligent horse-owning race in the world, we are, nevertheless, sadly behind in understanding the principles of an art which contribute so largely to the soundness and comfort of horses.

We cannot here enter into the unprofitable discussion of whether horses could or could not work without shoes, but must at once recognise the practical fact that shoeing is a

necessary evil, like many other things the outcome of the domestication of the horse. The object of shoeing is to prevent undue wear of the foot; this protection is given by a rim of iron nailed to the part. In applying this we must bear in mind the physiology of the foot, so as not to interfere with its functions more than we can help, and as nails have to be driven into living structure, we must by care reduce the evil thus produced to the narrowest limit.

The function of the wall of the foot is to bear the weight of the body; the same remark applies to the bars; the use of the sole is to protect the delicate parts inside, and, by its union with the wall, to assist in supporting the weight. The function of the frog is to prevent the horse from slipping; by its physical character, viz. india-rubber nature, it prevents concussion to the foot and limb, and through its position it supports weight, keeps the heels open, and so maintains the proper width of the foot.

The elasticity of horn is obtained by the amount of moisture found in its horn tubes; when these are destroyed the moisture evaporates, and the part becomes dry and brittle. Brittleness occurs when the wall is rasped, as is commonly done in shoeing, it is equivalent to removing the enamel from our nails by scraping.

This bare outline of the physiology of the foot tells us that the shoe should fit the foot, and not the foot the shoe, that it should have a perfectly level bearing on the wall and bars, that the sole should not be touched with the knife, that the functions of the frog are entirely destroyed by allowing the part to be cut away, and that it can only act and grow healthy and strong by resting on the ground. Physiology also tells us that no more nails than are necessary should be placed in the foot, and that the wall should not be rasped on its surface.

The function of the foot does not teach us the pattern of shoe needed. This depends upon the nature of the work, but the simpler in form the better.

So impressed is the public by the necessity of having different shapes and makes of shoes, that they have lost sight entirely of the infinitely more important point—the fitting of the shoe. My own opinion is that providing the shoe conforms with the principles of shoeing here laid down, that the pattern of shoe used is immaterial.

By care and attention to shoeing thousands of pounds' worth of property would be saved to the country yearly. There is no greater bane of horseflesh existing at the present time than the incompetent farrier and the ignorant owner.

The latter is solely to blame; he leaves the shoeing of his horses in the hands of ignorant and prejudiced servants, and the farrier has to do as directed by them or lose the work. The principles of shoeing can be learned by a child, and I look forward hopefully to the not very distant future when our English horses will be shod on scientific principles, and this only needs the hearty and intelligent co-operation of the educated public.

### *State Hygiene.*

So far I have only attempted a brief consideration of the important factors in the production of diseases which we have shown are largely under our control, and almost entirely in our own hands. I must now draw attention to the existence of certain diseases which are not so clearly controllable, are capable of inflicting enormous loss, and require prompt and energetic action to combat them. I allude to the many epizootic diseases affecting horses, cattle, sheep, and pigs, in this country.

There are certain epizootic diseases affecting all animals; there are others affecting only certain members of the same class, and others again which only affect animals of the one kind and no others.

Anthrax is a disease affecting nearly all animals, and equally fatal in each. Variola is another affecting nearly the whole animal kingdom, but with different degrees of severity, being exceedingly serious and fatal in the sheep, benign in the horse and cow. Rabies affects all, and is fatal to all. Tuberculosis, common in cattle, rarely attacks sheep, and still more rarely horses. Specific pneumo-enteritis is essentially a disease of the pig, known as swine plague. Cattle plague and pleuro-pneumonia affect horned cattle only. Glanders affects only solipeds and man through inoculation. Foot-and-mouth disease attacks cattle only. Foot-rot and liver-rot affect only sheep. Influenza and strangles are essentially diseases of the horse.

As a matter of fact, it may be stated that none of these diseases need really exist; most of them can be completely stamped out; some, owing to the vitality of the poison, are difficult to eradicate, of which the best example is anthrax; but assuming, as we are bound to, that of the purely specific diseases mentioned above none can arise *sui generis*, then the only logical conclusion is that stamping out should rid us of them for ever.

It would be difficult to imagine a country more perfectly suited to the exclusion of disease from foreign sources than the British Islands. It is true that our requirements in

foreign cattle are large, and that we draw from notoriously infected countries, or, at any rate, from countries which have been affected; still, given the conditions essential to prevent the introduction and spread of epizootic disease, and we find that in this kingdom they exactly exist.

When diseases of a contagious or infectious nature affect animals there is no reason why, so long as we know the definite conditions under which the poison is spread, that we should not be able to arrest its progress. We have this information for such diseases as anthrax, cattle plague, pleuro-pneumonia, foot-and-mouth disease, variola, foot-rot, glanders, farcy, rabies, tuberculosis. We have not got this information in respect of influenza and strangles. I do not mean it to be understood that the profession is unanimous in its views on these points, but we are pretty clearly agreed that glanders can only affect by contact with the poison, and that simply living under the same roof with a diseased horse will not infect a healthy one which has not come into contact with the diseased patient, and the same remark applies to rabies, anthrax, foot-rot, and foot-and-mouth. These diseases, like mange, require for their propagation actual contact with the poison, though not necessarily with the diseased patient.

Cattle plague, pleuro-pneumonia, variola, and probably tuberculosis, are undoubtedly diseases spread through the medium of the air of infected areas. Healthy animals introduced into sheds occupied by the sick, or into places where affected ones still exist, may contract the disease, though no actual contact has occurred.

Influenza, and perhaps strangles, affect horses quite irrespective of any condition; contact or no contact, infected buildings or otherwise, we have certainly reason for believing that the poison in the former disease may be carried for long distances by the air, and that all susceptible animals are affected by it.

There are thus three distinct classes of epizootic, and the efficient control of these increases in difficulty from I to III. Class I can be absolutely stamped out, as we know exactly the lines on which to limit the spread of the poison, which is a fixed one. Class II is more difficult, and apparently even slight air infection is sufficient to produce the disease; the poison is both fixed and volatile. In Class III the poison is probably wholly volatile, and is absolutely not under human control.

The methods to be adopted to rid ourselves of disease will depend, in the first instance, as to whether, like foot-rot, foot-

and-mouth disease, mange, influenza, strangles, &c., the disease is distinctly curable (*a*); or whether, like anthrax and cattle plague, it presents a high mortality (*b*); or like glanders, rabies, pleuro-pneumonia, and tuberculosis, it is absolutely incurable (*c*). For practical purposes we may class *b* and *c* together, and advise destruction; the number of recoveries in class *b* are small, and do not counterbalance the increased risk attending the keeping alive of such foci of infection.

I have previously stated that theoretically we should be free from animal scourges. The advantages we have over the human hygienist in this respect are enormous; we can destroy the affected, and segregate the sound or exposed. Nothing remains to us but the destruction of all affected in class *b* and *c*, and to a great extent the destruction of all absolutely in contact with the infected. This destruction must include not only taking away the life of the animal, but the destruction of the body, so as once and for all to rid it of producing further harm. Perhaps it is in this latter respect we fail more than any other. We allow, it is true, under certain conditions, the utilisation of hides, hoofs, horns, and even flesh from the infected, and thus most considerably contribute to the support of the life of the disease-producing organism. Occision should include destruction in its fullest sense. Isolation is the method employed for stamping out the diseases in class *a*, and for completing the measures adopted in classes *b* and *c*.

This isolation must be of the most perfect kind, such as can only be obtained by the assistance of the law. Infected places should practically be in a state of siege, though it is clear that such rigorous measures are only necessary when the diseases are such as are undoubtedly conveyed by the movements of animals, and by the attendants on the sick; they must be judged of also by the intensity of the poison.

Depending, again, on the nature of the poison, must such measures as the movements of all animals in the district, holding of fairs, &c., be prohibited; such measures, though extremely productive of public inconvenience, are essential in such diseases as sheep-pox, pleuro-pneumonia, swine plague, glanders, &c. &c.

The theoretical exclusion of disease from this country is obtained by means of our system of port inspection. I am not prepared to say that this latter is not capable of further improvement and extension, but I do say that this enormous work so quietly and unostentatiously carried out is the salvation of our herds. It is impossible to estimate the value of

our port inspection. That certain cases must escape detection is inevitable where so many thousands are being inspected, and when we consider the obscure symptoms of some of our most contagious diseases, notably tuberculosis and pleuro-pneumonia.

The value of quarantine is also fully appreciated where stock is landed from suspected countries, and the necessity of destruction at the port of debarkation, though full of inconvenience to the public, is a method of prevention of the greatest possible utility.

The laws regulating the transport of cattle across the country by rail and road appear to meet all requirements; they are not intended to apply to diseased stock, though of necessity, such cases must leak in. The disinfection of railway trucks is an important matter. I am rather inclined to regard the lime-washing as a useless measure when animals labouring under specific diseases have been carried; from a point of cleanliness, it is of course useful. I consider that railway trucks should be disinfected by means of superheated steam.

The transport of cattle by sea is a question which has gradually forced itself on the attention of the public. The profession for years has been alive to the cruel condition under which this is usually carried on. Larger air and deck space, better ventilation, specially constructed pens, and greater cleanliness are required. The fittings should as far as possible be of iron to facilitate disinfection, and should be securely fixed. The only real solution of the difficulty is the special construction of ships for cattle traffic, and none others should be employed.

### *Special Veterinary Hygiene.*

To the special branches which fall under the head of veterinary hygiene I have already previously alluded; it is here only my intention of describing one to which, perhaps, increased attention will be paid in this country. I allude to the cultivation of calf lymph for human vaccinations.

It does not fall within my province, nor in a paper of this kind is it desirable, to discuss the relative advantage of humanised and animal lymph. For our purpose it is sufficient to assume that animal lymph is required, and we have, therefore, only to point out in what way and under what conditions this can best be obtained, and endeavour to show that lymph so cultivated produces in the human subject a typical eruption, which we have every reason to believe is as protective as humanised lymph.

Calves are selected as the animals to be worked with, partly on account of their manageable size, but also from their less liability to be infected with such diseases as tuberculosis, and, moreover, because it is not impossible that the eruption is more typical and the yield of lymph larger in the young than in the adult animal.

The most suitable age is found to be between three and six months old; they should be healthy, well nourished, and weaned. This latter is an important point in the sense of economy; the expense of feeding the animals on milk is considerable.

Every animal before being used for cultivation purposes should be kept under observation for some days, and during this time the temperature should be regularly taken morning and evening. This period also enables one to determine whether the diet they are placed on agrees with them, for calves are most liable to a fatal form of diarrhœa from errors in feeding, alteration in diet, and other causes unnecessary to be named.

The most suitable daily diet for a calf of the age mentioned is, hay, 4 lbs.; grain, 2 lbs.; bran, 1 lb.; oil-cake, 1 lb.; mangels, 5 lbs. I believe that on a poor diet the yield of lymph falls off, and that it is economical to feed them liberally, if only on this account.

The sanitary conditions under which the animals live are very important to attend to. The surface of the body should be kept clean, and all soiled portions of the skin regularly attended to; they should be fed and watered three or four times a day; the stable in which they are kept must be clean, warm, light, and well ventilated, the drainage surface, walls regularly whitewashed and impervious; flooring dry, clean, and sweet, and the partition separating one animal from another should be whitewashed two or three times a week. The stalls erected for the calves should be sufficiently wide to allow them to lie down, but not to turn, the object being to prevent them getting at the vaccinated surface and destroying it by licking. The animals must be kept clean; to avoid them getting soiled by lying in their own fæces regular attention is required, and each calf should be allowed 4 lbs. of straw daily as bedding. The warming of the building must be carried out by hot-water pipes.

No animal should be used for vaccination purposes which has not been under observation for at least four days or even longer; during this time the thermometer must be diligently employed both morning and evening, the condition of the bowels should also be noted, and the most careful inspection

of the whole surface of the body carried out. Animals affected with ringworm or eczematous-looking skin should be rejected.

The vaccination is readily performed. The animal, by means of a special table, is placed on its side, and the hind legs being separated, the abdomen and inside of both thighs are carefully shaved, washed, and dried. I vaccinate over a large surface, but never carry the insertions below the middle line of the abdomen, as they would only get soiled and destroyed.

The number of insertions are from thirty to fifty, depending on the size of the calf. There is no reaction in the system depending upon the area covered; it makes no difference, either to the state of health or to the temperature whether we make thirty or fifty insertions.

The form of scarification is most important. I vaccinate over a square or circle, the diameter of a shilling to a halfpenny, by a series of light diagonal scratches which cross each other. No blood should be drawn; the lymph is then carefully worked in. I allow a few minutes to elapse after the last scarification before the animal is taken off the table.

There are other methods of infecting the surface, namely, by a single slight incision which only passes through the epidermis, or by punctures. Both these methods in my opinion are defective, inasmuch as they are wasteful; by the circle or square method three or four times more lymph may be obtained.

There is no rise in temperature for two days; on the third day a marked elevation generally occurs, but the health of the animal is not effected as judged of by the appetite; on the fourth day it is evident that the scarifications are taking, as indicated by a red areola round each; on the fifth day the vesicle is surrounded by a silvery areola, outside of which is a narrow red one, the vesicle is yellow in colour, the centre being depressed, darker, and drier than the surrounding parts.

On the fifth day the calf is placed again on the table, and the whole part thoroughly washed. For this purpose I use a hose attached to a tap, and every particle of soiled material is removed; by this time the peculiar characteristics of the vesicle become fully developed. It is remarkable how they come out through washing, a most unpromising-looking eruption after a thorough wash turning out a typical one. The surface in being sponged should not be rubbed, or the vesicles are damaged.

It is as well to starve the calf the morning it is required for collection, as owing to the length of time it is on the table the stomach becomes partly paralysed, fermentative gases collect, and the abdomen becomes distended. This is avoided by starvation.

Operators differ in their views as to the period to be selected for lymph collection. On the Continent the sixth and even the seventh day is selected, whereas in this country the fifth day is the one generally, and I think properly, chosen. It is certain that, in a small percentage of cases, the vesicles on the fifth day are not up to time; these may be allowed another day, but such cases are the exception.

It is necessary that we should be able to carefully discriminate between the vesicle fit for lymph collection and the one which is too far advanced to admit of its being used for vaccination.

(*To be continued.*)

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## LAHORE VETERINARY COLLEGE.

Gentlemen,—The announcement made in the telegrams published in India the beginning of last month, with reference to the probability of a change being made in the teaching staff of the Lahore Veterinary College, will, if carried out, be followed by disastrous consequences so far as the interests of the College itself are concerned.

In other departments in the "service," sudden changes are, as a rule, followed by untoward results; but in the case of both sudden and frequent changes in the teaching staff of a college or school, the evil effects of such changes become aggravated beyond measure.

Since the appointment of Professor Nunn as Principal of the Lahore Veterinary College in July, 1890, he has been most indefatigable in his efforts to advance the interests and usefulness of the Institution over which he presides; and in this work he has been ably assisted by Veterinary Lieutenant L. J. Blenkinsop, Consulting Veterinary Surgeon to the Punjab Government, Lahore. In fact, two better qualified officers could not have been selected for this special vocation; but as neither chooses to accept the conditions and terms at present offered by the *New Civil Veterinary Department*, they will be forced to resign their present appointments to give place to new candidates; and the results which must naturally follow such sudden changes in

the control, management, and teaching in the institution will most certainly tell against it for some years to come.

Few men are gifted with the power of teaching, and more so of imparting special scientific knowledge to students in a particular line.

The authorities in India have a habit of looking upon all professional men as alike, but in the present instance they should bear in mind that as the veterinary officers now employed in the Lahore Veterinary College have been proved to be exceptionally good men, and fully qualified for the posts they occupy, they should be allowed to remain on to complete the good work they have in hand, and not forced to resign by the enactment of "CIVIL RULES," which in their present form are not popular, and have not been accepted by the majority of Army Veterinary surgeons in India.

*August*, 1892. BEACON.

*To the Editors of the 'Veterinarian.'*

The *Madras Mail*, under the heading of "THE NEW CIVIL VETERINARY DEPARTMENT," says, "A military correspondent, writing to us on the 20th February last, drew attention to the difficulties that the Government of India would meet with in establishing the *New Civil Veterinary Department;* and, judging from the telegrams which have been appearing in our columns during the last week or so, his prognostications have been amply justified. The War Office authorities are opposed to the formation of the new department from the ranks of the Army Veterinary Department, because they consider that difficulties would arise in the event of candidates for civil employment electing to return to Military duty should the work not prove congenial to them, and that there would thereby be thrown out of employment a number of veterinary surgeons recruited to fill the vacancies. Naturally enough the prospect of temporary half-pay or a small bonus would not be sufficient to secure good men as stop-gaps, and it is not surprising, therefore, that the War Office authorities are unwilling to see their own men taken away. They doubtless remember, too, the failure that attended such a modified form of temporary service once before. Meanwhile there has been considerable reluctance on the part of the officers themselves to apply for employment in the new department. Not only are the civil allowances offered—ranging from Rs. 150 for a veterinary surgeon of less than five years' service, to Rs. 400 for a veterinary surgeon first class after ten years' service—considered hardly sufficient, but the leave and pension rules

still remain unsanctioned by the Secretary of State, and yet officers are being asked to subscribe their names to them. As regards the allowances, our military correspondent remarked, 'To offer a professional officer a trifle over and above that accorded to a staff sergeant or sub-conductor for five years' hard, anxious, and responsible duties under canvas, among sickness, scarcity, and probable distress or famine, is too mean to be discussed. Take, for instance, the young veterinary surgeon on Rs. 400 and Rs. 150 staff or civil pay, who may have to cover several miles a day, with double tents, supplies and comforts, cart and horse-keep, lascars, and other necessaries. How is he to live? What medical officer would accept such staff remuneration, except, perhaps, for a station sinecure appointment entailing his signature to an occasional return?' Government, nevertheless, has found men willing to serve on the terms proposed; though how many will elect to return to military duty after their year's probation yet remains to be seen. Their work is bound to be arduous at first. Out of the eighteen veterinary surgeons who will form the department four are for the remount service, four for horse-breeding, and ten remain for the poor agriculturist, and these are to be scattered over the whole of India and Burma."

## Facts and Observations.

Death of a Fœtus in Utero and Retention of the Remains.—At the recent meeting of the Yorkshire Veterinary Association Mr. Deighton, M.R.C.V.S., laid before the members an interesting specimen of the remains of a fœtus in the uterus of a mare, which had been retained for the long period of six years. The *Lancet*, Sept. 10th, under the heading of "Missed Labour in Animals," has some interesting remarks on this case, to which we would direct the special attention of our readers. Cases of this kind have occasionally come under our notice in cows and sheep in particular, but in each instance the retention of the Fœtal remains has been for a much shorter period.

# THE VETERINARIAN, OCTOBER 1, 1892.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

## DIAGNOSIS OF TUBERCLE.

WHEN the failure of Koch's tuberculine as a curative agent in consumption was recognised, there remained the hope that the agent might be of vast clinical importance as a means of diagnosis. To begin with, no doubt existed as to the fact of a decided reaction following the injection of small doses of tuberculine into tuberculous animals. Human beings exhibited the most powerful reaction, but the lower animals also showed by a distinct rise of temperature that they were also susceptible to the influence of the agent. Experiments at the Royal Veterinary College, published in the Annual Report of the Veterinary Department of the Board of Agriculture, did not sustain the reputation of tuberculin as an infallible guide to the detection of tubercle, because while tuberculous animals showed the rise of temperature which was expected, others, even in a more marked degree, exhibited the reactions, notwithstanding that no sign of tubercle could be detected *post mortem*.

Since the above results were arrived at, many experiments in the same direction have been carried out, and similar facts have been recorded. Among the observers, Dr. Bang, of Copenhagen, has been most industrious and painstaking in noting the results of his own experiments, and collecting those of other investigators.

In the *Ugeskrift* for July last Dr. Bang gives a record of his inquiries, and compares them with others.

In Dr. Bang's experiments only a small percentage of reactions occurred in animals which were not found to be tuberculous in *post-mortem* examination. In cases reported by Schutz and Rosval, of sixty-six animals inoculated forty-four which showed reaction were found to be tuberculous, but ten which showed reaction were free from tuberculosis

Other cases are recorded of the absence of reaction in advanced stages of tubercle.

In Nocard's cases twenty cows exhibited reaction, and eighteen were tuberculous. The other two had liver disease and enlarged lymphatic glands. Thirty-seven cows exhibited no reaction. Of these thirty-five were healthy, and two affected with a mild form of tubercle.

Dr. Bang's conclusion from the whole of the evidence is that tuberculine is about as perfect as most things in this world—it sometimes fails, which is exactly what we pointed out months ago. But he contends that the use of the agent furnishes reliable evidence of disease in 90 per cent. of the cases examined. In the face of the facts quoted by Dr. Bang it is not easy to accept this view.

If, out of every hundred cattle which exhibit reaction after inoculation, ten are free from tubercle, how is the evidence reliable? *i. e.* how are the ninety diseased beasts to be selected and killed, and the ten healthy ones to be saved? And in any one case, say of a pedigree cow or bull, tested by inoculation and exhibiting characteristic reaction, will any veterinary surgeon condemn the animal, knowing that it may prove to be free from the disease on *post-mortem* examination? If he will not condemn on such evidence the test is of no value in single cases.

But its value may be admitted in its application. The fact of all or the majority of animals exhibiting characteristic reaction will be evidence that tubercle is prevalent among them, and justifies the condemnation of the whole, even though a portion may be free.

Dr. Bang goes a step further than we are disposed to follow, in suggesting that the characteristic reaction of tuberculine may, after all, be more reliable than an ordinary *post-mortem* inspection. The doctrine is comforting to the experimenter who fails to detect the expected proof of the correctness of his diagnosis, but for all practical purposes it is best to make the *post-mortem* inspection the final test of the value of the agent used in testing.

## Extracts from British and Foreign Journals.

### PLEURO-PNEUMONIA: SLAUGHTER JUSTIFIED.*

By Professor Wortley Axe.

"*Inadequacy of Past Attempts at Suppression.*

"Ever since the dawn of historical times the suppression of animal plagues has occupied the attention of the most able and experienced sanitarians in this and other countries. The intimate relation of animal health to national wealth and prosperity has always been recognised in a greater or less degree, but with the progress of pathology, and the ever-widening interest it has evoked in sanitary science, the protection of our herds, flocks, and studs from the ravages of disease has become a matter of universal concern, and there is now scarcely a branch of human knowledge, the aid of which has not been requisitioned in the cause of protective medicine.

"From the crude resources and disconnected efforts adopted with regard to veterinary sanitary science until comparatively recent times, but little could be expected in combating the spread of animal plagues; but with the light of modern research, aided by a sound system of statutory and administrative legislation, the evil influence of these terrible scourges should now be largely curtailed, and in some instances altogether abolished. How these ends are to be attained is a question of the highest importance, not only to the sanitarian and agriculturist, but equally so to the political economist and the general public. The wide interest which the subject commands naturally leads to its being viewed from many different standpoints, and as in other public questions, so in this, private and political considerations have in the past dominated the teachings of science, and rendered legislation impotent if not actually mischievous.

"When the cattle plague visited our shores in 1865, the present generation knew comparatively little of the nature and deadliness of contagion. Pleuro-pneumonia and foot-and-mouth disease, it is true, had ravaged the country for nearly a quarter of a century, but, until the Russian pestilence appeared, stock-owners had come to regard them as burdens to be borne, rather than as evils to be exterminated, and, under the sore delusion of their 'spontaneous origin,'

* Reprinted from the *Journal of the Bath and West of England Society and Southern Counties Association.*

their 'indigenous' nature, their intimate connection with a mysterious 'something in the air' and soil, herds were permitted to suffer and to perish, while veterinary sanitary science was subordinated to the preaching and teaching of those whose only interest lay in open markets and fairs and unmolested traffic in disease. The advent of cattle plague in 1865 was not an unmixed evil. Heavy as were the losses arising out of it, it must at least be credited with having directed attention to the dangers of foreign cattle importation, and to the establishment of what has long been needed—a national veterinary sanitary service. Moreover it afforded an opportunity for demonstrating the utter futility of half-measures in exterminating foreign diseases, and the complete success which may be achieved by well-directed legislative measures. It cannot, however, be said that the experience so gained has been of much avail, for, until recently, no serious attempt has been made to relieve the country of its burden of animal plagues. Governments, both Conservative and Liberal, have come and gone, each in turn to exult in a bloated exchequer, and to relegate to erratic and irresponsible 'local authority' the administration of an important and difficult measure of 'sanitary police.' Fifty years have now passed since pleuro-pneumonia first entered English homesteads, and from the date of its introduction to the present time it has been permitted to decimate our herds and impoverish the British agriculturist, while American ranchmen and enterprising stock-owners of both Eastern and Western nations have risen to affluence on our wasted millions.

"*Nature of the Disease.*

"Pleuro-pneumonia is a specific infectious fever, and, like other similar disorders, there is reason to believe that it has for its cause a living organism—a minute parasitic plant or microbe, by whose growth, development, and propagation the disease is induced and spread.

"It is an important feature in this as in some other contagious affections, that the life of this pathogenic plant can only be sustained in a particular species of animal; hence it arises that pleuro-pneumonia is known to us only in connection with cattle. Some other disease-producing organisms have a much wider zoological range, inasmuch as they find a suitable habitat for their life and growth in many or all of our domesticated quadrupeds, as well as in man himself. This is specially the case with those of anthrax, rabies, and tuberculosis, all of which diseases are communicable to the horse, ox, sheep, pig, dog, &c.

"Moreover the virus of anthrax is capable of reproducing itself outside the body, and finds in certain soils all the conditions necessary to its existence and propagation; it follows, therefore, that it must ever be with us, notwithstanding the most rigorous measures of legislation, and the most refined administrative efforts of sanitary police. Tuberculosis stands much in the same position. Affecting, as it does, such a number and variety of our domesticated species, all of which live in the closest relations, there appears at present to be but little hope of its extinction, however much may be done to limit its spread. No such consideration pertains to pleuro-pneumonia. The limitation to a particular species places the question of its extermination in a different light, inasmuch as it simplifies the sanitary requirements of the case, and renders the employment of measures of extermination comparatively easy. Not only so, but the animals with which we are called upon to deal are in a great measure available as human food, and so far conduce to render those measures less wasteful.

"*Methods of Eradication.*

"To eradicate pleuro-pneumonia, one of two things must happen. The plant or virus must be destroyed, or the constitution of the soil, *i.e.* the animal in which it lives and fructifies, must be rendered unfit for the maintenance of its growth. These two requirements are comprehended in the terms 'stamping out' and 'inoculation.' In the former case it is prescribed that oxen affected with the disease, as well as those that have been in contact with them, shall be destroyed, in which case the virus perishes with the animal. In the latter the necessary change is sought to be effected by introducing into the blood of healthy animals products derived from the lungs of the sick.

"Oxen so dealt with are said to be 'protected,' or in other words rendered proof against infection. If by this latter method a universal immunity could be established in our cattle population, the virus of pleuro-pneumonia would cease to exist for want of a suitable habitat in which to propagate, and the disease would consequently disappear. As to the relative merits of these methods of exterminating pleuro-pneumonia, there has been in the past a very wide diversity of opinion among agriculturists and others interested in the welfare of live stock. To some the 'stamping-out' system appeared cruel and wasteful, while inoculation was recommended on the score of simplicity and the ease with which it could be applied.

"*Inoculation.*

"Since Dr. Willems, of Hasselt, in Belgium, first made known the protective efficacy of inoculation in 1850–51, a large mass of scientific evidence has been forthcoming in confirmation of his views.

"In 1851, France entered upon an official inquiry into the nature of pleuro-pneumonia, and a number of experiments were conducted by a commission appointed for the purpose, with the object of deciding how far, if at all, inoculation was protective. The conclusion arrived at was that it had the effect attributed to it by Dr. Willems, and did afford to animals operated upon an immunity against infection.

"The same conclusion was come to by a Dutch commission appointed in 1852, who reported that 'inoculation possesses the power, *at least temporarily*, to prevent infection; it remains uncertain how far the disposition for the disease is completely or only for a time destroyed.'

"Belgium, which was the home of inoculation, conducted an inquiry into the merits of Willems' discovery, extending over several years, during which time seven reports were made to the Minister of the Interior. The first six were undecided, if not actually unfavorable; but the last, which was made in 1886, admitted the value of the operation, and recognised 'the distinguished services which Dr. Willems had rendered to agriculture by his prophylactic method.'

"In 1860, while the disease was raging in our Australian colonies, Mr. Graham Mitchell instituted a series of experiments on the value of inoculation, and arrived at the conclusion that it was eminently protective; and Mr. Bruce, Chief Inspector of Stock of New South Wales, affirmed 'that millions of cattle had been successfully inoculated in Australia during the last twenty-six years, and that our stock-breeders, who own among them more than eight millions of cattle, and who have during that time been constantly putting inoculation to the test, are almost to a man in favour of the treatment.' Germany, Italy, Africa, and other countries have also testified to its protective efficacy.

"Very little has been done here in the way of systematic inquiry into the protective effects of inoculation. In 1852 Professor Simonds carried on several experiments at the instigation of the Royal Agricultural Society, and, in 1876, Dr. Sanderson and Professor Duguid were similarly engaged, but the extent of the inquiry in each case was so limited as to furnish no reliable conclusion as to the efficacy of the operation. The late Mr. Priestman, of London, Professor Gamgee, and later, Mr. Rutherford, of Edinburgh, each

practised it extensively, and with a large measure of success. That inoculation is protective against pleuro-pneumonia is amply proved, but it is at the same time true that, like the virus of smallpox, anthrax, and some other diseases, it not unfrequently fails to exercise its protective influence, and cannot, therefore, be relied upon to stamp out the disease. Nor can we say over what period of time its protection extends.

"If, however, inoculation afforded protection in every case in which it was skilfully employed, and if protection continued through the life of the animal, it still remains possible that by improper methods, or by the employment of virus carelessly selected, its prophylactic effects may sometimes fail to be realised. But the period of immunity resulting from inoculation is a matter about which we have no exact data, and, judging by analogy, it is reasonable to infer that, in this disease, as in smallpox and other contagious affections, it is only for a term, and in order to be kept up would require that the operation be repeated at certain indefinite intervals.

"Whatever doubt may exist as to the period of immunity afforded by inoculation, there is no doubt as to the failure of badly selected lymph to protect against infection. Moreover, we have known animals in many instances in the practice of the late Mr. Priestman to prove refractory to inoculation, but to readily contract the disease when exposed to natural infection. It follows, therefore, from these considerations, that, unless such disadvantages could be overcome, there would always remain in our cattle population a certain number of unprotected animals, and in order to keep up a supply of lymph there must necessarily exist others suffering from the disease. Indeed, the practice of inoculation presupposes the presence of pleuro-pneumonia, and that is the one thing which our present sanitary system seeks to render impossible. Moreover, it is asserted on no less authority than Reynal that animals inoculated with the virus of pleuro-pneumonia are themselves sometimes capable of infecting healthy stock, and other distinguished German veterinarians have also confirmed his observations. If this be true—which we have reason to doubt—the very means on which we have been asked to rely for protection are fraught with the greatest danger.

"As a preventive, inoculation may fairly claim a place in our sanitary service, but it is only as an adjunct to more radical measures that it has any value as a means of extermination.

"*Vitality of the Virus.*

"Since a clearer insight into the nature of contagion and a more thorough acquaintance with the character of pleuro-pneumonia have been imparted to the stock-owners of the country, the opposition to slaughter has not only been removed, but its unrestricted employment has been urgently demanded.

"This change of view I attribute in a large measure to our better acquaintance with the vitality of the virus, and the assurance it has afforded of the efficacy of the stamping-out system. For a long time it was held that the virus of pleuro-pneumonia, like that of some other contagious affections, was capable of living outside the body, and retaining its virulence while so situated for long periods of time. Thus, in his 'Four Bovine Scourges,' Professor Walley says:

"'The vitality of the virus is very great; under favorable circumstances it may preserve its virulence for twelve months or even more.' This is proved, he remarks, by the fact 'that healthy animals brought into infected byres after they have lain empty for the period mentioned frequently contract the disease;' and Professor Williams relies on similar testimony in justification of the same opinion. In this connection he observes, 'I have seen the disease break out in a byre which had stood empty for a period of three months, where every precaution had been taken to avoid contact with other animals in the introduction of the new stock.' Many veterinarians of less distinction have from time to time expressed their convictions in favour of this stability and abiding influence of pleuro-pneumonia virus, but both observation and experiment go to show that the facts related and relied upon by these gentlemen are capable of a different and, to my mind, a more reasonable interpretation. That animals put into byres which twelve months previously contained diseased stock have suffered from pleuro-pneumonia is by no means an unlikely occurrence; indeed, it is one which we have known to transpire again and again, but such a circumstance cannot be accepted as proof of the vitality of a virus. Experience has abundantly shown that large numbers of so-called 'new' and 'healthy' stock, although having the outward appearances of robust health, have possessed all the inward conditions of virulent infection. It is invariably stated by those who are unfortunate enough to suffer from a second outbreak of this affection, that after 'clearing out' their sheds, they purchased only healthy cattle to restock them; but where opportunities have occurred for *post-mortem* inspection of

their 'new' purchases, it has usually been found that one or more, and in some instances many of these so-called 'healthy' animals, exhibited unmistakable evidence of long-existing disease. In such cases a mass of dead tissue, soaked in virus, is usually found in the substance of the lungs, and from this disorganised mass, resulting from a former attack of pleuro-pneumonia, contagion continues to be given off for many months. This has been painfully illustrated recently in numerous instances since the central authority commenced its work of extermination. Cases have occurred where, in the space of two or three months, dairymen have suffered from as many fresh outbreaks of the disease, each time starting with fresh stock.

"To say that infection lingered in the sheds; that the original virus had retained its vitality, and infected each lot of new stock, is a very natural conclusion to draw, and in the absence of any more reasonable explanation might be accepted without question; but *post-mortem* examination demonstrated the fallacy of such a conclusion, for in each batch of animals, all of which were supposed to be healthy, disease was found to exist, and in such form as to leave no doubt as to its presence in the lungs at the time of purchase. It may, and will, seem strange to the uninitiated that animals so seriously diseased should escape observation, but the difficulty of identifying this malady during life is sometimes very great. In the case of a herd of beasts recently slaughtered by the central authority, as many as twenty out of fifty head supposed to be healthy were found on *post-mortem* examination to be diseased. Instances of the transmission of pleuro-pneumonia by mediate contagion—as through hay, straw, excrement, flesh, and other fomites—have from time to time been referred to as evidence of the vitality of the contagion, and in explanation of the propagation of the disease. But such a mode of spreading is altogether opposed to the teachings of experiment, and in the light of present experience cannot be accepted without further confirmation, in which the possibility of direct infection from diseased cattle must be altogether excluded.

"In this connection we have again and again known healthy cattle to occupy byres within a couple of days of the removal of diseased stock without contracting the disorder, and on two occasions we have seen healthy cows passed into sheds, out of which infected beasts had been removed only the day previously, with the same negative result; and this, I believe, has been done repeatedly by dairymen whose cattle have been killed out in the course of

the administration of the Act. Some contagious affections can with certainty be communicated and spread by mediate contagion, and are therefore independent of the movement of animals suffering with the disease for their transmission and propagation; but for the spread of pleuro-pneumonia animal intercourse is essentially necessary, and it has been truly said that 'no country in the world has ever had it introduced without a live cattle trade with infected countries.' Numerous experiments have been made in order to determine whether the infection of pleuro-pneumonia could be spread by any other agency than cohabitation of diseased with healthy animals. Some of these were conducted at the Royal Veterinary College in 1872, when large quantities of the exudate from the diseased lungs were injected into the jugular vein, into the structure of the lungs, and also into the trachea, without any result beyond the formation of a small abscess at the seat of puncture. In another set of experiments large quantities of the exudate were given by the mouth, also without any positive results. With a view to test the infective power of the diseased organs, the lungs from a recently killed animal affected with pleuro-pneumonia were taken and put in a shed with four healthy heifers, and kept there for several days. These experiments were repeated without any result. Fodder, litter, and manure were taken from places in which diseased cattle stood, and were placed in contact with healthy cattle, and in every case without leading to the transmission of the disease. The whole of the cattle used for these different experiments were afterwards slaughtered, and a careful *post-mortem* examination made, but without revealing any indications of disease of the lungs. The same negative results followed upon similar experiments undertaken by Dr. Sanderson and Professor Duguid in 1876, at the instigation of the Royal Agricultural Society. Here, as at the Veterinary College, fluid from the lungs of diseased cattle was injected into the blood-vessels of some, and beneath the skin of others; it was also thrown into the windpipe in the form of a spray, but without in any case inducing the disease. Moreover the lungs of an animal, recently killed, and while yet warm, were placed in the manger out of which cattle were fed, with the same negative result. Common experience affirms what experiment teaches, viz. that the virus of pleuro-pneumonia quickly becomes inactive after it leaves the body of the victim.

"This question of the vitality of the virus, or, in other words, the period of time during which it is capable of re-

taining its infective property within and without the living body, is one of the first importance, as upon it must depend in a large measure the success of any system of sanitary police upon which the country may rely for extinguishing the disease arising out of it. To know the conditions under which a particular contagion lives, and the influences by which it is enfeebled and destroyed, is one of the first essentials in the science of protective medicine.

"That the virus of pleuro-pneumonia, while contained within the body, is capable of retaining its vitality and power of infection for long periods after the disease has subsided, is now generally admitted.

"From a sanitary point of view this is one of the worst features of the affection, and conduces more than any other to the dissemination of the malady. The fact is well established that the great bulk of the outbreaks of pleuro-pneumonia arise out of the introduction into herds of what are now known as 'old lungers,' *i. e.* animals who having recovered from an attack of the disease, and regained all the outward appearances of health, continue for months to give out the germs of disease.

"Outside the body in which it is incubated the contagion of pleuro-pneumonia has little power of endurance, but seems to require for the maintenance of its existence and propagation direct transmission from the sick to the healthy. Cohabitation or approximation of the former with the latter are necessary conditions of infection. From these considerations I am led to regard the virus of pleuro-pneumonia as one of the most unstable and perishable of contagia when outside the body, and although it retains its vitality within the lungs of the convalescent for long periods, it quickly perishes with the death of the animal that bears it."

(*To be continued.*)

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## GLANDERS AND FARCY—IMPORTANT MEETING OF THE VETERINARY PROFESSION.

A LARGE and influential meeting of the members of the Royal College of Veterinary Surgeons practising in the metropolis and suburbs has been held to consider the necessity of an amendment of the law relating to Glanders and Farcy; Mr. W. J. Mulvey, the President of the College, in the chair.

The attendance included, among many others, Veterinary Colonel Duck, Captain Raymond, Professors Pritchard, Macqueen, Edgar, and Penberthy; Messrs. J. Simpson, J.P., W. Hunting, H. R. Rogers, and Hurndell.

The chairman said that in consequence of the continued increase of glanders amongst horses in the metropolitan police district he considered it to be his duty to convene that meeting, with a view of considering the best means to be adopted for its suppression. The death of several human beings from glanders directly contracted from horses suffering from this disease had been the means of awakening public attention to the danger which existed. He hoped that the result of the meeting might be that representations would be made to the Board of Agriculture asking for such an alteration in the law as might be the means of eradicating the loathsome disease. As the law now stood a distinction was made between glanders and farcy, although the veterinary profession had for years pointed out that they were really one and the same disease. In the case of glanders, an inspector could, after giving fourteen days' notice to the owner, order an animal to be destroyed, but in farcy he had really very little power. So long as visible evidences of disease existed, he could order the owner not to work the animal in the street, and here his power ended, and as soon as the external evidences of disease had disappeared—as they would do for a time—the owner could do what he liked with the animal, work it or sell it; and generally the horse was sold, with the result that it passed into some one else's stable and communicated the disease all round.

As an evidence of the steady increase of glanders amongst horses, he mentioned that in 1882 thirty counties infected with glanders returned 858 cases, and twenty-two counties infected with farcy returned 531 cases, making a total of 1389 cases. In 1891, twenty-eight counties returned 1260 cases of glanders, and thirteen counties returned 1175 cases of farcy, making a total of 2435 cases, or an average of 46·8 per week. Estimating the average value of these horses at £15 each, they had the large sum of £36,525 lost to the country by an absolutely preventable disease. In the four weeks ending the 27th ult. 288 cases were reported, of which 238 occurred in the metropolis. He learnt on good authority that the Board of Agriculture recognised the existing danger, and that an order in Council was in course of being drafted somewhat on the following lines:—Glanders and farcy to be scheduled and dealt with as one dis-

ease; that County Councils might order the compulsory slaughter of animals affected with farcy, paying for the latter half a fair valuation; that every veterinary surgeon should be compelled at once to report to the inspector of the local authority every case of infectious or contagious disease amongst animals that came under his notice, in respect of which report he would be paid a small fee. Failing to report any case he would render himself liable to a prosecution.

After considerable discussion the following resolutions were adopted:—1. That amendment and consolidation of the law relating to glanders and farcy was necessary. 2. That in any alteration of the law immediate and compulsory slaughter must be applied to all cases of farcy as well as to glanders. 3. That a more systematic inspection of infected or suspected places be enforced. 4. That a staff of veterinary inspectors, directed by the Board of Agriculture, be specially appointed to effect the extirpation of glanders and farcy. 5. That compensation be paid for all horses slaughtered as farcied or suspected of being farcied or glandered. 6. That this meeting views with disapproval the action of the Metropolitan Drinking Fountain and Cattle Trough Association in again opening their troughs for the watering of horses, as such troughs are undoubtedly a great source of disseminating glanders.

Copies of the resolutions were directed to be sent to the Board of Agriculture and the County Council, and a committee of five was appointed to support the resolutions by deputations to the authorities concerned.

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## THE STAMPING OUT OF GLANDERS.

"THERE is at last some evidence that steps will be taken to deal with glanders in a more enlightened and efficient manner than has hitherto been the case, and that what was becoming something of a scandal will no longer be tolerated. It has required a good deal of urging and agitation to rouse the authorities to a sense of their duty; but better late than never. There should be no great difficulty in combating the disease, even without compensation; indeed, it should be to the interest of horse-owners to have it extinguished without being bribed to report the existence of the disorder in their stables. Nothing is more liable to abuse than this system of compensating owners for the destruction of horses suffering

from an incurable contagious disease ; it is fair and proper to pay them for those which are not affected, but which may have been killed because of glanders being suspected in them, but to compensate them for those animals which are visibly and unmistakably glandered is unjust to the taxpayer, and very likely to lead to fraud and neglect. It is to be hoped that we shall hear no more of glanders and farcy being treated as different infections ; for the latter form is quite as dangerous if not more so than the former, and should be as energetically dealt with. It has been stated that the incubation and course of glanders are protracted, but this is not so in all cases. The period of incubation is most frequently brief, and not seldom the malady runs a rapid course ; hence there are acute and chronic glanders, the first being nearly always observed in the ass, though it is also often witnessed in the horse. With the discovery of the valuable properties of mallein there should not now be any hesitation in establishing a diagnosis in what were formerly considered to be doubtful cases, as the subcutaneous injection of this substance will prove the existence of the disorder in a horse which may otherwise exhibit no signs of it. Even without this reagent farcy is easily enough diagnosed, as its indications are manifested on the exterior of the body ; it is only in the internal form of the disease that doubt has sometimes been felt ; but by the employment of mallein this should no longer be experienced. It is to be hoped that in devising rational measures for the suppression of glanders among our own horses care will be taken that it is not introduced by those which are imported in such large numbers ; for the fact must not be overlooked that the scourge prevails in every European country, in Egypt, America, South Africa, and India. By a system of rigid inspection it has not been allowed to enter Australia, New Zealand, or Tasmania ; but in England, so long as horses are permitted to come from infected regions, we shall always be liable to its introduction unless the greatest care be exercised."—*Lancet.*

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## ATTENUATION OF THE VIRUS OF RABIES.

"Babes and Cerchez (*Ann. de l'Inst. Pasteur,* September 25th, 1891) have studied the effect of the cells and liquids of naturally refractory animals on the virus of rabies. This forms a corollary to their already published statements (*ibid.*, 1889) that the blood of hyper-vaccinated animals itself

possessed a protective power against rabies. Their experiments were performed first upon frogs, and consisted in placing portions of the medulla or cord of rabbits dead of rabies in their dorsal lymph-sac, allowing them to remain there for a longer or shorter time, and then using the material for inoculating fresh rabbits either by trephining or *sub cute*. The results showed that after fifteen days' stay in the lymph-sac, the virus began to undergo attenuation, but not so markedly as by exposure of the cords to dry air, neither did the attenuation follow a perfectly regular course. During its stay in the lymph sac, however, the nervous tissue became in greater measure disintegrated and infiltrated with leucocytes. The attenuation became more evident, if, instead of using rabbits, the virus was injected into dogs subcutaneously. In this manner it appears that cords which had remained for some days in the lymph sacs of frogs became for dogs perfectly efficient vaccines against the most virulent material. Having thus ascertained that frog's lymph exercised, when in the body, an attenuating action, it became interesting to ascertain its influence when withdrawn from the body. The lymph obtained by inserting dry sterilised pieces of sponge into the lymph sac and leaving them till they became saturated, was mixed with an equal quantity of a fine filtered emulsion of the cord from a rabid rabbit. After a time the mixture was introduced by trephining under the meninges of rabbits, controls being also inoculated with the emulsion unmixed with lymph. Under these circumstances it was found that the emulsion very rapidly lost its virulence. It was next sought to ascertain wihether the blood of immunised dogs exercised any protective action over rabbits or other dogs. The authors found that while this had no effect in rabbits, a certain amount of protection was evidenced in the case of dogs ; out of four experiments two dogs recovered after inoculation. If, however, the virus were mixed with the blood to be tested, and the mixture used for inoculation, they found that its virulence was very soon destroyed. The authors find in these experiments a further confirmation of their previous dictum that 'the liquids or cells of animals rendered immune or naturally proof against rabies are capable of transmitting immunity to other animals.' They propose that this fact be made use of in the preparation of antirabic vaccines, and have already successfully employed such material in the treatment of twenty-five out of twenty-six cases of bites by rabid animals."—*British Medical Journal.*

## DEATH FROM HYDROPHOBIA.

THE death from hydrophobia of H. L—, a lad seventeen years old, a joiner, calls for something more than passing notice. On August 1st, 1887, his brother (a young man aged twenty-six) and J. W. W— were all bitten by a mad fox-terrier dog. The two brothers and W— went to Paris four days after they had been bitten, and were submitted to the antirabic treatment in the Pasteur Institute for about fourteen days. On their return to this country the elder brother succumbed to an attack of hydrophobia nine weeks after he was bitten, whilst the other two patients continued apparently in good health. The younger lad stated that he had no fear of hydrophobia, and for five years he had no symptoms of anything of the kind. On September 1st, however, he began to complain of pains in his neck, arms, and back; when he attempted to drink he was seized with spasms, which became more marked until the 4th; he then became very nervous; he had to be held down in bed, and chloroform was administered; he foamed at the mouth, called out, was convulsed, and ultimately he died exhibiting all the symptoms of hydrophobia, a diagnosis that was said to be confirmed by *post-mortem* examination.

The *Lancet* of September 17th, in commenting on this case, says:—"The period of incubation in this case is a most extraordinary feature. Hitherto the longest period at which an attack of hydrophobia has supervened after a bite is said to be about two years and a half, and it is very remarkable that if this was a case of true hydrophobia the appearance of the first symptoms should have been at such a late period after the bite. It seems that the patient had suffered from blood-poisoning a short time ago, and from the nature of his employment the possibility of this being an attack of traumatic tetanus must not be overlooked. It is certainly a matter that should be carefully inquired into. The symptoms and *post-mortem* appearances are so much alike in the two conditions that a mistake in diagnosis may possibly have been made."

## DEATH FROM HYDROPHOBIA—THE VICTIM BITTEN FIVE YEARS AGO.

An inquest has just been held at Huddersfield on the body of Herbert Lindley, aged seventeen, the son of a farmer residing at Cumberworth, who died from hydrophobia.

The evidence showed that over *five years ago* Lindley and his brother Frederick were bitten by a strange dog. A few days afterwards they were taken to Paris and underwent M. Pasteur's treatment. Five weeks later symptoms of hydrophobia developed in the case of Frederick Lindley, who was removed to Huddersfield Infirmary, and died the day following his admission.

Herbert Lindley continued in fairly good health until very recently, when he complained of pains in the arms and body. He was removed to the Infirmary, and died there shortly afterwards. The medical evidence was to the effect that it was an undoubted case of hydrophobia, and a verdict was returned of death from hydrophobia, caused by the bite of a dog five years ago.

[Instances of the long incubation of the rabid virus in dogs and other animals which had been bitten have frequently come under our notice. In one case—in a dog—fifteen months elapsed before the bitten animal became affected with the malady.—Eds.]

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## THE NATIONAL VETERINARY ASSOCIATION.

The annual meeting of this Association was held in Glasgow on Thursday, August 3rd, and was unusually well attended. Nearly all the leading veterinary teachers and experts of the day were present, the attendance in all numbering about 100. The President of the Association—Principal McCall, of the Glasgow Veterinary College—presided over the deliberations of the assembly.

At the outset of the proceedings the President delivered an address of welcome to the Association, and expressed the pleasure he had at seeing such a large gathering of veterinary practitioners and distinguished teachers of veterinary science. He trusted they would have a very instructive and harmonious meeting.

*Bailie Brechin,* on behalf of the magistrates of the city, also welcomed the Association, and expressed the hope that much practical good would result from the meeting.

On the motion of *Mr. Rutherford,* Edinburgh, it was

unanimously agreed that the place of meeting next year should be Manchester.

*Election of President.*—On the motion of *Mr. H. Thompson,* Aspatria, Cumberland, seconded by *Mr. H. Kidd,* Accrington, Mr. Edward Faulkner, Manchester, was unanimously elected President for the ensuing year.

The Secretary (*Mr. Malcolm*) next read the annual report. Among other matters referred to he stated that reports had been presented by the following members of the Investigation Committee on "Milk Fever:"—Messrs. McConnell, Kidd, McGavin, Woods, Penhale, Mayor, Lepper, Russell, Clarke, Toope, Hughes, Pickworth (for H. Olver), and Reynolds (for Professor Axe). On "Hæmoglobinuria" by Professors Walley, Limont, Cooke, and Smith; and Messrs. Faulkner, Bloye, Wragg, Hoare, and Hopkin.

*Number of Members.*—Last year the number of members was 280. Since then fourteen had resigned, five had died, and twenty had been struck off for not having paid their subscriptions since 1888. During the year, however, forty-eight new members had joined the Association, making the present number 289.

*Treasurer's Report.*—The Treasurer reported that the Association maintained a fairly prosperous financial condition. In addition to £200 in Consols, there was a balance in hand of £168 4*s.* 4*d.* The balance in hand last year was £119 5*s.* 11*d.* Seventy-seven members were still in arrears, notwithstanding the fact that each had received three reminders.

### *Veterinary Department, Board of Agriculture.*

*Professor McCall* then delivered an exhaustive address, in the course of which he said:—During the past year this department, by an outbreak of "foot-and-mouth disease," has been put on its trial, and its greatest opponents have been forced to admit that it has nobly responded to the test. As you are aware, on 4th February last a number of Danish cattle on sale in the London Metropolitan Cattle Market were found exhibiting symptoms of this disease. The gates of the market were closed, and all the animals within the premises slaughtered, but notwithstanding such vigorous measures, on account (as it afterwards transpired) of animals in the *incubative stage* having been exposed on a previous market day and removed to various places, the disease in due course manifested itself in the cow-sheds of London, and at various points in the counties of Kent, Sussex, Surrey, and Middlesex. On the 11th day

of the same month Professor McFadyean declared the presence of the disease in a byre in Edinburgh, but, as far as known to me, the method by which the infection reached Edinburgh has not been demonstrated. On 4th March the disease appeared among a number of fat cattle in the Moore Street Slaughter-house, Glasgow. Its introduction to this city was clearly traceable to Edinburgh. The affected animals were brought from Edinburgh, and in the *incubative* stage exposed and sold in the Glasgow Cattle Market. From Glasgow, in animals in the incubative stage, the disease was conveyed to Settle, Leeds, and Paisley. Under directions of the Board of Agriculture, and with the sanction of their proprietors, all the animals in the Glasgow Slaughter-house and Market were killed, the gates of the Slaughter-house and Market closed, and even after thorough cleansing and disinfection they were kept shut, and all traffic suspended for three weeks. The effect of these operations was the stamping out of the disease in Glasgow. It is six years almost to a day on February last since we had an outbreak of foot-and-mouth disease in Scotland, and for two years prior (as I shall immediately show) the cases were few in number; and as there are now many in the profession who have had no practical experience of the malady, or opportunities of observing the enormous pecuniary loss it has caused to stock proprietors in the past, I shall very briefly refer to a tabulated statement on the subject which has been compiled by the veterinary department of the Board of Agriculture. The official record from 1870 reads as follows (Great Britain):

| Years. | Counties. | Fresh outbreaks. | Animals attacked. | | | | |
|---|---|---|---|---|---|---|---|
| | | | Cattle. | Sheep. | Pigs. | Other animals | Total. |
| 1870 | 84 | 27,254 | 379,395 | 39,714 | 38,407 | 84 | 457,564 |
| 1871 | 92 | 52,164 | 519,523 | 116,546 | 54,931 | 560 | 691,560 |
| 1877 | 55 | 858 | 5,640 | 7,405 | 2,099 | — | 15,144 |
| 1878 | 45 | 235 | 912 | 8,609 | 245 | — | 9,766 |
| 1879 | 29 | 137 | 261 | 15,681 | 5 | — | 15,947 |
| 1880 | 38 | 1,461 | 20,918 | 9,572 | 1,886 | 2 | 32,378 |
| 1881 | 49 | 4,833 | 59,484 | 117,152 | 6,330 | 80 | 183,046 |
| 1882 | 49 | 1,970 | 23,973 | 11,412 | 2,564 | 1 | 37,950 |
| 1883 | 75 | 18,732 | 219,289 | 217,492 | 24,332 | 32 | 461,145 |
| 1884 | 55 | 949 | 12,186 | 14,174 | 1,860 | 1 | 28,221 |
| 1885 | 10 | 30 | 354 | 34 | 30 | — | 418 |
| 1886 | 1 | 1 | 10 | — | — | — | 10 |

A brief analysis of this table shows that in the years 1870 and 1871 there were 80,000 separate outbreaks, affecting 1,150,000 animals. Then there was a period of six years' cessation. Then the disease was again imported in 1877, and continued for eight years without intermission and without any favorable abatement, the total fresh outbreaks being 29,175, and the number of animals attacked 783,597. In the year 1885 the outbreaks were only 30, and the number of animals attacked 418. These outbreaks took place early in the year, and the disease was again "stamped out," but, as you observe, at an enormous loss. About nine months after the disease had disappeared, viz. in the year 1886, there was an outbreak involving 10 cattle, and as I had personally to deal with this solitary outbreak, and, moreover, as it is of great interest and value in proving that the microbes of foot-and-mouth disease can be conveyed to this country in foreign straw, I shall briefly state the facts. On 1st February, 1886, I received a telegram from the Privy Council Office, instructing me to proceed to Brunton Barns, Markinch, Fifeshire, and investigate a suspected outbreak of foot-and-mouth disease. As there had been no reported cases of foot-and-mouth in the three kingdoms for nearly a year, I concluded that it was a "false alarm;" but, to my astonishment, when I arrived at the farm I found the whole of the animals presenting the characteristic lesions of the malady. To inquiries I ascertained that the affected cattle had been bought at an auction mart four months previously, that there had been no cattle on the farm for nearly a year before they were brought on it, that the bullocks entered the feeding courts the day of their arrival, and had never been out of them, or in contact with any other animals. Observe there had been no cases of foot-and-mouth in England, Scotland, or Ireland for nearly a year, and no known cases elsewhere in these kingdoms at the time. At a loss to understand from whence the infection came, as I am no believer in the "spontaneous generation" of a specific disease, I made a careful examination of the premises, and, coming upon a few bales of Dutch straw, I said to the cattleman, "What are you doing with foreign straw?" "Master bought it to thatch the corn stacks, and it came from Burntisland." "Have you fed or bedded the cattle with it?" "No; but we used some of it the day the travelling mill was here threshing, and it was just two days after that that the first bullock began to 'slaver' at the mouth, and the next day others 'slavering' made us suspect that we had got foot-and-mouth." "What

use had you for straw at the threshing mill?" "Well, the engine and mill were placed right in front of the sparred gate leading to the first feeding court (in which there were five bullocks), and as the mill was blowing her chaff among the bullocks, the master told us to pile up the foreign straw on he outside of the spars, and prevent the chaff blowing over, and this we did." "Did the bullocks get to the straw?" "Yes, they did, and they pulled the straw through the spars with their tongues, and chewed it." As I have already stated, foot-and-mouth disease had no existence in the three kingdoms at the time, except on this solitary farm, and all the ten animals on it were affected with the malady, and I feel convinced that the straw was the vehicle of infection in this outbreak. By an order of the Local Authority, and on the advice of the local inspector and myself, the animals were slaughtered the same evening, and from that day till the present outbreak (now also stamped out), which commenced on February last, a period of six years, the disease had no existence in this country. It cannot too widely be known that "foot-and-mouth," like "rinderpest," is not an indigenous, but imported disease, and that the conditions necessary for its existence do not exist in this country. It is the most infective of all bovine diseases, and although the mortality is less than in any other specific disease, still the pecuniary loss for the time it is allowed to prevail is undoubtedly the greatest, and the lowest calculation of actual loss per head is £1 10*s*., and that too when there are no deaths. Waves of this disease, since its first introduction to this country in 1839, have regularly swept over the land, lasting on an average of six years with intervals of three years, but through the organisation of the veterinary department the outbreak of 1886 was cut down within one week, and at an expenditure of less than £300; and the outbreak of 1892 has been extinguished within six months. By the energetic manner with which Mr. Chaplin, Minister of Agriculture, has grappled with this last outbreak, he has saved millions of money to stock proprietors, and shown to a demonstration that a State veterinary department and educated veterinarians are worthy of greater consideration and recognition than has as yet been universally accorded to them in this country.

### *Pleuro-pneumonia Epizootica.*

This is another of the bovine maladies which the veterinary profession, through the Board of Agriculture, have

staked their reputation in extinguishing in this country. It is also an imported disease, and made its first appearance in 1841. Prior to the passing of the Contagious Diseases (Animals) Act in 1869, the annual loss from this disease to the dairymen of this city on an average of twelve years reached the large sum of £4556. In Glasgow thirty years ago this disease existed in almost every dairy within the city—probably there was no other city in which the disease was more prevalent; in fact, one dairyman alone, who had 1100 cows, placed all his sound cows at purchase amongst his worst affected, so as to get them to take the disease, and those that recovered he bred with; but by enforcing the orders of Council it has been gradually controlled and curtailed, and for the past three years there has not been a single case of contagious pleuro-pneumonia in any cow-shed within the municipality of Glasgow. There are two methods of dealing with this disease, viz. inoculation and slaughter. The first method belongs to a profession, but being only a preventive measure and not curative, in order to its efficiency slaughter of all affected and in-contact animals would require to proceed alongside inoculation of all other animals, and even then, for reasons which I have not time to enumerate, a certain amount of uncertainty would exist as to its complete extinction. Undoubtedly the quickest and most certain method of dealing with this malady is slaughter and full compensation; in short, the method recommended by certain members of the profession to the Select Committee of the House, and now carried on under the direction of the Board of Agriculture. And just as in the case of "rinderpest" and "foot-and-mouth disease," so soon as the last affected animal is destroyed (and to all appearance that will be within two years) we will hear no more of the malady until it is re-imported.

### *Reports—Milk Fever and Azoturia.*

The Council's report from the Investigation Committees on milk fever in cows and also on azoturia in horses were then submitted. Thirteen members reported on the first-named subject, and nine reported on the latter. The reports gave the individual experiences of the different members regarding the nature, prevention, and treatment of the two maladies.

The *President* remarked that the information contained in the reports was of a most important character, and had brought a considerable amount of light on those subjects, but at the same time they were not by any means complete; and instead of discussing them in their imperfect condition

it would be much better that they should remit them back, and in another year they might become the subject of full discussion.

*Professor McCall*, in retiring from the chair, was unanimously elected Vice-President for life.—*Extracted, with some additions, from the 'North British Agriculturist.'*

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## MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the Midland Counties Veterinary Medical Association was held at the Grand Hotel, Birmingham, on Tuesday, August 9th, 1892.

Mr. F. W. Barling presided, and the other gentlemen present were Professor Walley, Messrs. Jno. Malcolm, H. M. Stanley, R. Wilson, T. Butcher, H. A. Barrett, John Thomson, Geo. Smith, Harry Olver, J. M. Parker, Thos. Horton, E. Beddard, Joseph Coe, H. L. Pemberton, John Blakeway, A. L. Gibson, H. J. Dawes, R. Cartwright, L. C. Tipper, E. G. Crowhurst, Alfred Over, Jno. Higgins, F. B. Jones, H. D. Pritchard, R. Cartwright, A. E. Paley, C. H. Wilson, R. Alpin, Wm. H. Blackburn, R. L. Green, C. Byner, L. W. Heelis, W. Beddard, R. J. McAwse, F.R.C.S., and Geo. Edward King.

The *Secretary* (Mr. H. J. Dawes) read the circular convening the meeting, and also the minutes of the last meeting, which were approved.

*New Members.*—The following nominations were made:—By Mr. Malcolm, Mr. Halpin, of Rugeley; by the Secretary, Mr. G. E. King, of Newport Pagnel; by Mr. G. Crowhurst, Mr. John James Crowhurst, his son; and by Mr. Alfred Over, Mr. W. W. Grasby.

The circular letter from the Central Veterinary Medical Association, concerning the matriculation and the four years' course, was read by the Secretary.

*Mr. Malcolm.*—I think it may be worth while to consider whether it would be worth our pains now to go into this subject. The Council has adopted resolutions for a higher matriculation and an extended curriculum, and I take it that nothing we can do will either stay its course or make it the more certain.

The *President.*—I propose that the Secretary be instructed

to write to the Central Veterinary Medical Association to say that, inasmuch as the subject has been already discussed and decided upon, we think it is not necessary for us to go into the matter.

*Mr. L. C. Tipper* seconded, and the motion was agreed to unanimously.

*Professor Walley* then read a paper on "Putrefactive Processes in Relation to Disease."

The lecturer, in introducing his subject, disclaimed any special bacteriological knowledge; but as they were in a position to take advantage of the results of the labours of bacteriologists, there was no need for any excuse for its introduction. In considering the effects of the products of putrefaction upon the animal body, he said the condition they give rise to was commonly termed blood-poisoning, but that term was deficient in precision. Septicæmia and pyæmia, long used indifferently, were now used distinctively; nevertheless the conditions known by these names were frequently associated. In 1878 Koch drew a distinction between septic intoxication and septic infection. Disease due to the introduction of products of putrefaction into the blood he termed septic intoxication, but that due to the introduction of the organisms themselves septic infection. The word putrid was frequently used in place of septic, but that was a distinction without a difference. In putrid intoxication the blood of the affected animal was not infective when introduced to other animals, but it was so in septic infection. For a long time *Bacterium termo* was applied to the organisms of putrefactive fermentation, but it was now well known that under that term were included a number of different species. With reference to the question of pathogenic organisms becoming under certain circumstances non-pathogenic and *vice versâ*, he said Pasteur had simplified the matter, so far as the first aspect of the question was concerned, by rendering virulent organisms non-virulent. In fact, these lower organisms were, like their higher prototypes, capable of modification in a variety of ways; therefore the line between pathogenic and impathogenic organisms was by no means so clear as might at first be thought. Many years ago Professor Law, of Cornell University, demonstrated in the milk of cows suffering from a low form of fever an organism identical with one found by him in the water of the well from which they drank, and he was able to reproduce or arrest this fever at will by simply withholding or allowing access of the animals to the particular water.

While there existed legitimately a doubt as to the power

of multiplication in the blood-stream of the organisms of putrefaction, there existed no doubt as to their power of producing putrefactive changes in organs where vitality had been lowered or arrested by depriving them of nourishment, *e.g.* by arresting the circulation locally. Chauveau, many years ago, showed that if the spermatic artery of a goat be tied the testicle dies, but it does not putrefy; but if previous to the ligaturing of the artery putrefactive matter be introduced into the general circulation, putrefaction of the mortified organ results. The production of putrefactive processes and the poisonous action of their products was favoured by such predisposing influences as bad hygienic surroundings, lowered constitutional vitality, mixed infection, and functional or organic disease of important organs. The effects of lowered vitality are seen in many ways in general practice. Ewes improperly fed and subjected to the vicissitudes of the weather are not only subject to endometritis and putrefactive mammitis, but their lambs become the subject of omphalitis and its results; and this condition was at once done away with by initiating a change of management. Also, when subjected to lowering influences, a simple stomatitis in the dog became a gangrenous affection, and simple catarrh in all animals assumed malignant properties. Not only did lowering or relaxing influence the production of general or systemic putrefactive processes, but it hastened the advent of such processes locally.

In speaking of mixed infection, the essayist referred to the possibility of the excretions of different micro-organisms which, themselves harmless when separate, might unite and develop poisonous properties.

In reference to the connection existing between dead or dying animal tissue and the initiation of putrefactive processes, he said it was a generally accepted theory that whenever any organic tissue was deprived of its vitality it was liable to undergo putrefactive fermentation; but this doctrine was true under certain conditions which he indicated. The professor then referred at some length to the remarkable similarity in the action of ptomaines and of certain vegetable alkaloids on the animal body, and concluded his very able paper by a detailed description of the general and special symptoms and clinical phenomena observed in septic diseases.

Upon resuming his seat the Professor was warmly applauded.

The *President.*—We are all very greatly indebted to Professor Walley for his very able paper. It must be to every

veterinary surgeon a very interesting subject, and unfortunately it is one the study of which I, with a country practice, find it difficult to afford the requisite time to give to it. I hope there may be a good discussion, for I am sure we shall all benefit by it.

*Mr. Over.*—The paper, sir, is so exceptionally able, and travels over so large a field, that it is impossible at a moment's notice to discuss it adequately. It would be easier to do so after seeing the paper in print. But I may say that, while listening to it, cases have offered themselves to my mind which have happened in my practice and have hitherto bothered me, but which, if they recur, I may now be able to elucidate. What Professor Walley has said as to the exercise of care in castration I can fully endorse, for I remember that some twenty years ago, when I was necessarily younger than I am now—(a laugh)—I was suddenly called upon to castrate six calves, and used a knife with which I had made a *post-mortem* examination, and that they all died. I suggest that the discussion be postponed to the next meeting. (Hear, hear.)

The *President.*—I quite agree that that proposal is worth considering, but I may say that Professor Walley cannot promise to attend the meeting.

*Professor Walley.*—I shall be very glad to be present if I can manage it, but I cannot undertake to be present.

*Mr. Malcolm.*—If Professor Walley could have seen his way to come back I would have been the first to second the motion, but as I gather there is a grave doubt, I think a discussion in his presence would be more satisfactory. I think, therefore, we ought to continue the discussion now, and later on you can consider whether we should adjourn it. Like Mr. Over, I feel a difficulty in speaking on Professor Walley's paper, but there are several points touched upon by him of great interest to us as practical veterinarians; *e.g.* he has pointed out the necessity for good sanitation, and has very forcibly impressed upon us that diseases, naturally benign in their character, take on malignant properties under conditions of lowered animal vitality. For instance, he tells us that simple stomatitis in the dog under bad hygienic surroundings becomes a gangrenous affection; and a simple catarrh in cattle becomes a malignant one when animals are confined in the vitiated atmosphere prevalent on board some cattle ships. With reference to the Professor's use of the words septic and putrid I am not quite clear, but it appeared to me that he used them indiscriminately. May I ask whether this

is so, and if we may take it that these terms are identical in their meaning and may be applied synonymously? Then there was one matter he referred to which was of great moment, viz. that Professor Law had found certain pathogenic organisms in the milk of cows in consequence of these cows having drunk water containing these organisms. If this were true, we had here such a source for the propagation of disease as was scarcely conceivable. If it be true disease could be communicated through animals to man with great facility, in that case there need be no question that such diseases as scarlet fever, as contended for by many able men, could be readily propagated through the agency of the cow. You had only to admit the contagion of scarlet fever to the drinking water of cows to contaminate the milk. But many of our very ablest pathologists maintained that so far there was not a particle of proof of the transmission of such diseases to human beings in this way. What was Professor Walley's own opinion on the subject, and could he cite any reliable authority who had tested and proved the accuracy of Professor Law's conclusions? Then the picture the Professor draws of non-pathogenic organisms assuming pathogenic properties was enough to frighten them all, had he not at the same time told us of the protective power of our own inherent vitality. He was glad to hear of the beneficial effect of such agents as arsenic and quinine in cases of septicæmia, and all the more so as his own success in treating that disease had scarcely been all he could wish. There was just one other question he would like to ask, and that was with reference to Professor Walley's opinion as to the cause of a great fatality among lambs sometimes supervening upon castration. In a recent paper on the subject it was attributed to malignant œdema. Now, so far as he knew, there was no record in any of our text-books or periodicals bearing out this. What was the Professor's view? Were these cases of malignant œdema or septicæmia? or might it sometimes be one and sometimes the other?

*Mr. Blakeway.*—May I ask what Professor Walley considers the shortest time which might elapse before we should find pus in a wound, after, say, a nail had punctured; and whether pus would be longer forming in some structures than in others? I was a little surprised to hear him speak against perchloride of mercury, because its use is so generally advised.

*Mr. Butcher.*—Has Professor Walley met with any so-called cases of endometritis occurring in heifers? and does

his experience endorse that of two recent writers in the *Veterinary Journal*, namely, that it occurs rarely in heifers of any other colour than white? Since Christmas I have had three cases, and these have all been in white heifers. Can he give us any explanation as to how it is produced?

*Professor Walley.*—In the first place, in reference to the question put by Mr. Malcolm as to the terms septic and putrid, if you will look at any dictionary you will find that one has its origin in the Greek and the other in the Latin, and that they are practically synonymous. That they are not used so synonymously as they at one time were I am well aware. "Septic infection" is a very old term, and it is only within the last few years that the term "putrid intoxication" has become common. Indeed, I do not know that as yet it is in common use. I first saw it in 1889, in one of the lectures published by the Sydenham Society. I don't know that this is a matter of very great importance so long as we understand what we are talking about, and one is apt to use the terms indifferently. As to the other question of Mr. Malcolm's with reference to micro-organisms in milk, I said that I had had my attention directed to it for the first time by a perusal of Professor Law's paper, but in that paper reference is made to a report by Dr. Percy of the New York Academy of Medicine, issued in 1858, on "swill milk." In the United States cows are fed on swills from distilleries, &c., with the object of forcing as much milk as possible; and Dr. Percy says that the presence of spores in such milk is patent, and that it produces indigestion in infants. It seems to me it is only a question of whether organisms are likely to gain access to the blood through the vessels of the intestines. That some organisms can do so is proved by the fact that we do, as I have said, get the organisms of putrefaction so introduced into the system. We know that positively. Woodhead, in his book on bacteriology, says that processes of this kind are set up whenever the mucous membrane is damaged from any cause whatever, and in the milk of sewage-fed animals you frequently get putrefaction set up in a few hours if it is allowed to stand aside, and even the products of the milk readily putrefy. You may say the organisms get into the milk after its withdrawal from the animal, and that may be perfectly correct, but all the same the milk is in such a condition as to predispose to putrefaction. I am sorry I have no evidence at hand in support of Law's view, but I know that such evidence exists. I fancy the question of the gaining of access by organisms to milk, or in other words to the milk, and thence

to different organs, would depend a good deal upon their size. One or two very important and interesting experiments have been recently made in connection with this subject. For instance, it has been shown that certain organisms may be passed through the blood without affecting the endocardium or the myocardium; but if you mix your infective matter with solid matter to which the bacteria can adhere, you can produce myo- and endo-carditis and a variety of other processes which are never seen under other circumstances. You then make the organisms too large to pass through the minute vessels of particular structures; therefore I imagine that if organisms be too large they will not pass from the intestines into the blood. I know this is an extremely important question in relation to scarlet fever, and I hope the doctors will succeed in settling it. As to malignant œdema, I believe that most of the deaths after castration are due to nothing more or less than putrid processes, not malignant œdema at all. As to the use of arsenic, it may be of interest to you to know under what circumstances I first used it. I had a case in Edinburgh of putrefactive pneumonia, and I had adopted all my usual methods of treatment; I was, I may say, at one time taught to believe that such cases never recovered, but I have frequently seen the contrary. In this case, however, recovery did not progress as I wished, so I tried arsenic for an experiment, and the result was simply magical. I notice that comparatively recently some of the best of our medical bacteriologists have come to mention and recommend it in conjunction with quinine. As to the length of time within which pus makes its appearance in different structures, I have seen it in the feet after eight or ten hours, and in dogs after twelve hours; but you expect as a rule the lapse of at least twenty-four hours. I am well aware it is often a question of importance to distinguish the length of time a wound has been inflicted. Certainly differences in structure and conditions have much to do with it. The more cellular a structure the more rapidly pus will form, the more fibrous the less rapidly, and so with the nature of the irritant. As to perchloride of mercury, I particularly alluded to a statement in a French journal. I myself should not hesitate for one minute to use it, always taking care that it is not too strong. Both in taking away putrefied placenta and in dealing with putrid endometritis I have found chloride of lime as good as anything. I think Mr. Butcher will remember that when he was at college I used to direct attention to the condition he

mentions as occurring only in white heifers. I mean, of course, probably in a very large percentage of cases. Mr. Lewis, of Crewe, was about the first man to mention this. A curious thing about it is that you may practise in forty districts and never come across a single case, and then you may find it in the forty-first. I never met with it in the Midland counties, Lancashire, or Wales, but in Cumberland and Westmoreland it is commonly recognised, and some practitioners keep trocars of a large size for puncturing the hymen. It is due either to non-rupture of that membrane, or to its partial rupture and the subsequent rapid healing of the wound, so that you get a collection of menstrual fluid. My own impression is that when the fluid is putrid the latter is the case, and that air has found its way in; otherwise you would not get putrefaction set up.

*Mr. L. C. Tipper* moved, and *Mr. Malcolm* seconded, a vote of thanks to Professor Walley for his paper; and it was cordially agreed to.

In reply the professor said that he knew the subject of his paper was a difficult one; but there was none more important to the veterinary profession, and none which confronted them so incessantly. Unless they knew something about it, they might lose the lives of animals and a good deal of hard cash too. (Applause.)

On the motion of *Mr. Over*, seconded by *Mr. Olver*, the next meeting was appointed to be held at Rugby. A vote of thanks to the President for his conduct of the proceedings closed the meeting.

Afterwards the members and visitors dined together.

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## SOUTH DURHAM AND NORTH YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

THE fourth annual meeting of this Association was held in the North-Eastern Hotel, Darlington, on Friday, September 2nd, at 3.45 p.m.; Mr. F. R. Stevens, President, in the chair. There were also present Messrs. H. Gelsthorpe, G. J. Harvey, and W. N. Dobbing, Darlington; G. E. Nash, Richmond; Jno. Nettelton, Northallerton; P. Snaith and H. H. Roberts, Bishop Auckland; A. Peele, West Hartlepool; and W. Awde, Barnard Castle.

*Visitors:*—Messrs. G. R. Dudgeon, Sunderland; Peele, jun., Durham; Dr. Manson; and Mr. Atkinson, Sanitary Inspector, Darlington.

Mr. Awde having vacated the chair in favour of Mr. Stevens, a hearty vote of thanks was accorded to him for presiding during the past year.

The minutes of the previous meeting were taken as read and confirmed.

Several interesting cases were then brought forward.

The *President* exhibited a two-year-old colt, which after being fed and then exercised would cough, and some portion of the food be ejected from both nostrils. This had existed to the owner's knowledge for at least twelve months. He also related the case of a cow which was continually having pieces of stick wedged into her nostrils. This had occurred repeatedly, and in spite of precautions being taken to prevent a recurrence of it.

*Mr. Peele* showed a mass of hair which formed the contents of a cyst which he had excised.

*Mr. Nash* showed a thermometer in which a screw connection had been substituted for the bayonet-joint.

*Mr. Nettelton* also exhibited a new thermo-cautery instrument for firing, made at his suggestion by Mr. Huish, the greatest improvement being the substitution of an end similar to an ordinary firing iron, and of sufficient weight to balance the part held in the hand. This end can be easily screwed off and two other ends affixed for puncture-firing when required.

The discussion on Mr. Brigg's paper was postponed until the December meeting, owing to his absence from home.

*Mr. Stevens* moved that on and after September 2nd, 1892, all visitors to the Association should be presented with free dinner or tea, as the case may be.—Carried.

Mr. G. J. Harvey, M.R.C.V.S., Darlington, and Mr. A. Neish, M.R.C.V.S., Northallerton, were unanimously elected members of the Association.

The *Treasurer* then submitted his annual report, which showed a balance in hand of £9 11*s.* 1½*d.*, and several accounts presented were ordered to be paid.

The *President* then delivered his inaugural address as follows:

Gentlemen,—It is with a great deal of pleasure that I meet you here to-day. I must at once thank the members of our Association for the honour they have done me by electing me their President for the ensuing year. I very much hesitated at accepting that honour, as I felt there is so much responsibility in holding such an office; but I trust that the members will assist me by bringing plenty of material forward at our meetings, by regular attendance,

and by that good fellowship which has hitherto existed amongst us as members of this Association, so that my year of office may at least not prove burdensome to you. It is not my intention, gentlemen, to give you a long address, as I often think presidential addresses are looked upon as the one drawback to annual meetings. There must be a great similarity, and as we are all anxious to hear Mr. Thompson I shall at once bring before your notice a few subjects of interest to the profession. I suppose it will generally be accepted amongst us that the new Charter is one of the most important subjects. The profession has shown emphatically and decisively that a new charter is needed, and I must say I cannot understand those gentlemen who are supposed to have the interest of their profession so much at heart opposing it in the manner they have done, and thereby causing so much unnecessary expense. The Charter itself has been so well discussed, and members have been made so conversant with its details, that I feel it is quite unnecessary to repeat them ; but before leaving the subject I would suggest that the Charter be well guarded and watched over until it has become law, for which we must depend upon those members of Council whom we have sent mainly for that purpose to look carefully after our interests. It is a matter of very great regret that the Royal Society for the Prevention of Cruelty to Animals is persecuting as well as prosecuting our members. Each one of us, I feel sure, sympathises with that Society, and has hitherto been willing to render every assistance in its good work ; but if the Society continues to act upon the lines it has lately I fear much of that sympathy will be lost. Indeed, I will go further, and say that it will be necessary for the Royal College of Veterinary Surgeons to be called upon to take action in the matter, and to defend its members when unjustly prosecuted ; and I also think that those members who give evidence against other veterinary surgeons because their treatment may not coincide with their own (in these particular cases) are even more to blame than the Society. Take, for instance, "lymphangitis." A well-known veterinary surgeon, when reading a paper before this Society, advocated exercise. Now supposing a newly qualified man, just starting practice, carried out that treatment after hearing that paper read, would it not be most unjust if that young man should be prosecuted? Even if he won his case, is it not likely to do him considerable harm, and in some cases might it not be his ruin? We all know there are persons who believe that it would be most cruel to exercise a lame horse, and would never employ a veterinary surgeon who

had been prosecuted for so doing. We must all regret that the Society should waste its time and energy on such cases.

Another subject: It is a matter of congratulation I think, that the veterinary surgeon has been the means of considerably arresting that (to the agriculturist) all-important enemy, foot-and-mouth disease. Too much credit cannot be given to Mr. Rayment for discovering the existence of the disease, or to the Veterinary Department of the Board of Agriculture for tracing the infected cattle in so short a space of time; and I venture to think, if there had not been decisive action together with great care and knowledge displayed by the cheif veterinary surgeon of that department, foot-and-mouth disease might have been as prevalent now as in most of its previous outbreaks. We all know that when a few years have passed without an outbreak, precautions become neglected; cattle seem also to be much more susceptible to the disease, and consequently it spreads most rapidly. There have been only ninety-four outbreaks since the first of February, but I regret to find that on August 16th there still existed two outbreaks, both in the borough of Leith.

The stamping-out process seems also to come to the fore with regard to pleuro-pneumonia. We cannot hope, however, that pleuro-pneumonia can become extinct for some years, one great reason being the difficulty the farmer has to recognise the disease in its early stages, and in some isolated cases even the veterinary surgeon is puzzled. There have been up to August 16th 58 outbreaks since last September, there were 295 outbreaks during the previous twelve months, and 499 the year before. Statistics, therefore, show a marked decrease in pleuro-pneumonia since the stamping-out process was brought into force.

Doubtless we are all looking forward to the good which we hope will result from the Royal Commission on Tuberculosis. The interesting and instructive details of this commission should in a great measure help to alleviate the ills which arise from this wretched disease. It is surprising to find how many and to what an extent even young cattle are affected by it. This only demonstrates how necessary it is that qualified veterinary surgeons should be appointed as inspectors of dairies, both for town and country. The fact that a great proportion of the milk consumed in towns comes from farms at a distance is very often overlooked. It is under existing arrangements impossible for parents to feel sure that the milk they purchase for their children is free from bacilli, and it appears to me that they have a right to

demand protection in this matter as far as it is practicable. I think, if they knew as much as we veterinary surgeons do about the number of cows suffering badly from this disease, and freely discharging the germs of it through the mammary gland, they would not resent so little an addition to the taxes as would be required for the appointment of proper inspectors.

I am sorry to note that glanders is on the increase. It is argued that it is not so, but I fail to see how this is made out; certainly it is more extended. It was almost an unknown disease in the country districts, but this is not so now. I had a case only a few weeks ago. The horse had been driven to market—had been in contact with all the other horses on the farm. The owner objected for some time to have it slaughtered without compensation. There, I think, lies the great reason for the spreading of this disease. I believe there is no compulsion to slaughter, and certainly no compensation. These are, in my opinion, two of the greatest causes of the spread of glanders; and I think the time has arrived when this matter should be taken up by the authorities, and an alteration of the law brought about. It does not seem to be sufficiently known how fatal it is to the human subject, and what risks people run in attending on horses affected with it.

It appears to me that if veterinary surgeons were appointed inspectors of all dairies (rural and urban), slaughter-houses, and abattoirs, of contagious and infectious diseases, and of meat, each would have all his time occupied; and I contend that he should be properly remunerated, and not permitted to practise privately, as it is impossible for him to act as inspector without offending some clients; even the fees which are generally allowed for the work which the veterinary surgeon is at present occasionally called upon by the authorities to do, often do not compensate him for his time, and certainly not for the harm it does him as a practitioner. I think if this matter were brought before the Minister of Agriculture, he would see the necessity for the appointment of properly qualified men.

I am glad to find that two more of our members have been appointed as inspectors, and doubtless the favoured places will be glad to have the satisfaction of knowing that the meat they eat is wholesome.

The Army Veterinary Department is to be congratulated on the recognition it has at last received; and I am inclined to think that the recognition is mainly due to the respect in which the members of that department are held, and it

certainly includes men of whom we have cause to be proud. In Professor Smith we have a gentleman who has done good service to the profession by giving us the benefit of any treatment he has proved to be advantageous. His treatment of sidebone alone is worthy of the highest praise. In February, 1889, I operated on both fore-feet of a horse that had been lame nearly two years. Everything else had been tried. In about six weeks the horse became sound, and has remained so. Since then I have operated successfully on several horses for sidebone, and also for ringbone when the horn was pressing upon the growth. I contend that such men as Professor Smith are worthy of the Fellowship degree without any examination. He has conferred a great favour upon us by giving full particulars of his operation, and by advising the members to try it. I might mention others who have conferred equal benefits, and who ought to be recognised, not only by us, but by the Government. It is a subject for regret that our Government does not give encouragement to the veterinary profession. If a member is recognised at all it is in his capacity as a Mayor, as upon the occasion of the Queen's jubilee; seldom or ever on account of his distinguished ability. If it were not for such societies as the Royal Agricultural, Brown Institution, &c., we should have absolutely no encouragement for research.

It is unfortunate that there has been no satisfactory settlement of the methylated spirit question. Submitting a formula to the Inland Revenue authorities for their approval entails extra work, extra expense, and great inconvenience. The difference in the cost of the two spirits, rectified and methylated, is of considerable importance, more especially in country practice, as cattle require larger doses than horses, and yet we cannot charge even as much as the town practitioner. I hope the Council will not let this matter rest until it is on a more satisfactory basis. It appears now to be definitely arranged that after September, 1893, our matriculation examination in general education must be sufficiently advanced to satisfy the General Medical Council. The four years' course will also begin in April, 1895. These are, I think, steps in the right direction, as the more cultured the members of any profession are, the better position that profession takes; and I venture to think that the low standard of general education required has been one of our greatest drawbacks. This subject takes me back to my college days, and brings to my mind the way in which students were treated during the time of the examinations. No student knew when he was going to be examined,

sometimes he did not even know the day, but had to wait about the college until his name was called. This uncertainty did not tend to strengthen the student's nerves. Possibly by this time matters may have improved, but from what I gather from recently qualified men, the students are not treated with the consideration in this respect that they might be. The Veterinary Students' Union should call attention to this matter. A great deal has been written lately upon professional etiquette, and it is a most difficult problem to solve. I have no doubt that if we were all in good practices and doing well there would be very little occasion to discuss this subject. We all have our living to make, and as long as so much of our business depends upon grooms and coachmen, so long will it be a question of etiquette *versus* livelihood. Every young member of our profession must make a living if he can; and I think he would stand a poor chance of doing so if he started in practice without in any way either advertising or calling upon possible clients. He would have to remain at home waiting until some case came in; and I think you will agree with me that he would probably have to display a great deal of patience, and when, if ever, the case came, he must show that his ability, conduct, education, or appearance is superior to the man he has come to oppose. There are various forms of advertising and various opinions as to what constitutes improper advertising. I think it would be difficult to find the happy medium. It has been said that the sister profession do not advertise. They have not the same necessity for doing so; their chances of working up a practice are so much greater than ours, as there are more possible patients for them than for veterinary surgeons in a given space in any town. I must allow that professional etiquette might be much more practised than it is, particularly in consultation cases, but I fear the time has not yet arrived when we can do away with advertising, sending circulars, &c. I believe that some of us already send in their accounts without giving particulars; this is a great saving of labour and expense, and I think many more of us would like to do so, but it would be necessary for the members in each town to be unanimous for it to be practicable.

I think each association should arrange in a great measure its own veterinary politics, such as agreeing to certain fees for examinations, mileage, &c., that all might charge the same. Members should report their grievances, and in that way many difficulties which tend to disunite us might be easily surmounted. Before concluding I have

pleasure in informing you that our Association, although a small one, still continues to flourish. We now number twenty-three members; the meetings are generally well attended, and I expect to hear a satisfactory report from our worthy treasurer, Mr. Nash. He is well qualified for that office, and if he does not gather in the funds I don't know who can. This Society is really an offshoot from the North of England Veterinary Medical Association, and we have great pleasure in welcoming several members of the parent society here to-day; they are always ready to help us, and as we are a small association we are grateful for their assistance. Gentlemen, I thank you for the patience with which you have listened to me during the reading of this address.

*Mr. Awde* proposed, and *Mr. Gelsthorpe* seconded, that a hearty vote of thanks be accorded to the President for his address. Carried.

Mr. Thompson, of Aspatria, for some unexplained reason, was not present as promised to deliver his paper on "Dentition in Horses and Cattle."

The annual dinner was afterwards held in the hotel, Mr. Stevens again presiding.

The usual toast list was gone through, and a pleasant evening was spent. W. AWDE, *Hon. Sec.*

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## NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting took place at the County Hotel, Newcastle-upon-Tyne, on Friday, August 19th, 1892; the President, G. R. Dudgeon, in the chair.

*Present:*—Messrs. Hancock, William Hunter, C. Stephenson, Gofton, Elphick, D. Dudgeon, J. E. Peele, Shivas, and the Acting Secretary.

Letters and telegrams regretting their inability to be present were received from Professors Williams and Walley, Messrs. D. Macgregor and J. B. Nisbet.

The minutes of the last meeting were taken as read.

Mr. T. R. Jarvie, Gateshead, was unanimously elected a member.

The *President* nominated Mr. Lawrence, Stockton.

In accordance with the resolution adopted at the last meeting the following letter was sent to Mr. J. E. Peele, Durham:

HEDWORTH HOUSE, EAST BOLDON, R.S.O.;
*May 23rd*, 1892.

DEAR SIR,—At the meeting of this Association held on Friday, 20th inst., it was resolved unanimously that we, on behalf of the members, tender you our hearty congratulations on the honour conferred on you on being made a Justice of the Peace, an appointment which not only reflects credit on yourself individually, but upon the profession of which you are so worthy a member.

Trusting that you may be long spared to fulfil the onerous and responsible duties that will devolve upon you, we beg to remain, on behalf of the members of this Asssociation,

Yours faithfully,

(Signed) G. R. DUDGEON, *President.*
J. W. T. MOORE, *Act. Sec.*

The following reply was received:

8, NEW ELVET, DURHAM;
*May 25th*, 1892.

DEAR SIRS,—I beg to acknowledge the receipt of your kind letter of the 23rd inst., conveying to me on behalf of the members of the North of England Veterinary Medical Association their unanimous and hearty congratulations on my being made a Justice of the Peace.

Allow me through you to tender them my most sincere thanks for this spontaneous expression of good-will, which affords me the greatest gratification. I consider the position not only an honour to myself as a citizen of Durham, but also to the profession to which I belong.

Yours very truly, (Signed) JNO. EDWARD PEELE.

G. R. DUDGEON, Esq., *President.*
J. W. T. MOORE, Esq., *Secretary.*

The *President* proposed, seconded by *Mr. Hancock*, that the letters be entered in the minutes. Carried unanimously.

The *President* exhibited nine intestinal calculi, the largest of which, about the size of a large orange, had passed from the small intestines through a rupture of their coats, and was the first thing observed on opening the abdomen. The remaining calculi were found in the colon. The owner had had the animal six years, during which time it had never had a day's illness.

*Mr. Stephenson* expressed surprise at a large calculus having passed through the ileo-cæcal valve.

*Mr. Elphick* gave the history of a case in which he found fifty-four calculi, varying in size from a large orange to a hazel nut.

*Mr. Chivas* had removed seventeen from the rectum of a van horse.

*Mr. William Hunter* gave the history of a case in which he found a large calculus in the abdominal cavity, and an immense one in the intestine.

The adjourned disscussion on Mr. William Hunting's paper on "Fistulous Wounds" was continued.

*Mr. Elphick* had found, in cases of quittor, Jeyes' fluid very efficacious; some cases required one injection only, but where necessary he repeated the injection every third day.

*Mr. William Hunter*, in quittor, used a corrosive sublimate plug.

*Mr. Peele*, in quittor, made free use of the bistoury, hydrarg. perchlor. in solution, also chloride of zinc with blisters.

*Mr. Shivas*, in quittor, used carbolic acid and glycerine.

*Mr. Gofton*, in quittor, made free use of the knife, treating afterwards as a common wound. Would give Jeyes' fluid a trial the first opportunity.

The *President*, in the treatment, thought there was a good deal of luck. Some cases heal quickly, others seem to resist every agent you can think of. He had used almost everything; if one remedy did no good, then he tried another. He thought quittors could not be prevented.

The *President* proposed, seconded by *Mr. Stephenson*, that a hearty vote of thanks be accorded to Mr. Hunting. Carried unanimously.

*Mr. Hunter* proposed, seconded by *Mr. Hancock*, a vote of thanks to Mr. Stephenson. Carried unanimously.

The usual vote of thanks to the President terminated a very interesting meeting.

JOHN W. T. MOORE, *Acting Sec.*

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## MISCELLANEA.

**Prosecutions by the Royal College of Veterinary Surgeons.**—At the Ramsgate Petty Sessions, held on the 29th August, Mr. George Beart was summoned at the instance of the Royal College of Veterinary Surgeons for representing himself as a veterinary surgeon. Mr. Wotton (instructed by the College Solicitor) prosecuted. The defendant appeared in person and pleaded guilty, but said what he did was done in ignorance. Mr. Wotton, having stated the facts, called as witness Mr. H. C. Brannan, who deposed that he was a

clerk to Mr. Thatcher, the College Solicitor, and that in the month of June last he went to the Rose Inn, Broadstairs, and there obtained the circular which he produced, which represented that one R. Beart practised as a veterinary surgeon at Ramsgate and Broadstairs. On the 22nd August he attended at the plaintiff's place of business in Addington Street, Ramsgate, and saw a similar circular posted up in the window; he compared it with the circular produced, and was prepared to say that they were identical. Mr. G. Thatcher deposed that he was the Solicitor to the Royal College of Veterinary Surgeons; he produced their official Register for the year 1892, and the name of George Beart was not in it. In the month of June last, in accordance with instructions, he wrote to Mr. R. Beart at Broadstairs, summoning him to appear before a meeting of the Registration Committee to answer a charge of conduct disgraceful to him in a professional respect, with regard to a paragraph in the circular as to forcing horses' mouths. He was present at that meeting, and the defendant then attended, and at first it was supposed that he was Mr. R. Beart, a member of College. He was asked whether he published the circular, and he said that he did; subsequently he stated that his name was George Beart, and that R. Beart was his brother, and did not know about the circular. He was then asked if he was a qualified person, and he admitted that he was not; he expressed sorrow for what he had done, and promised not to repeat the offence.

Mr. Wotton said that the College considered it a bad case, and he pointed out that the defendant could hardly plead ignorance of the law, as although on the 19th of July, the date of the meeting, he had promised to discontinue the offence, yet the witness, Mr. Brannan, had proved that on the 22nd August he was still displaying the bill.

The magistrates retired to consider the matter, and on returning into Court said they should not inflict a heavy fine, as they intended to make defendant pay the costs of the two witnesses from London; they therefore fined him £2 with 11*s*. costs, and £5 additional costs to include the witnesses' fees—altogether £7 11*s*.

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At the Bristol Police Court on Tuesday, the 13th September, 1892, Alfred Martin, of 304, Stapleton Place, Stapleton Road, Bristol, was summoned for an infringement of Section 17 of the Veterinary Surgeons Act, 1881. Mr. W. R. Wansborough (of the firm of Wansborough and Robinson, of Bristol) prosecuted as agent for the Royal

College of Veterinary Surgeons, and Mr. Clifton (of the firm of Clifton, Carter, and Co.) appeared for the defendant.

Evidence was given that outside the defendant's house was a signboard containing the words "Alf. Martin, Veterinary Practitioner. Cattle Treated for all Kinds of Diseases." The Register was put in to prove defendant's name was not on it.

Mr. Clifton, on behalf of the defendant, pleaded guilty, and stated the board had been up for four years, and defendant had put it up in ignorance of the law, but had now taken the board down, and promised not to again put up one of a like description.

The bench pointed out to defendant that when persons entered into any profession they were supposed to make themselves acquainted with the law. As, however, he seemed to have acted in ignorance, he would be dealt with leniently, and only fined £1 and costs.

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At the Liverpool Police Court on Friday, September 16th, 1892, Edward H. Walsh, of 2, Tulford Street, Liverpool, was summoned for an infringement of the 17th section of the Veterinary Surgeons Act. The prosecution was conducted by Mr. Fred. Smith (of the firm of Grace and Smith, of Liverpool), as agent on behalf of the Royal College of Veterinary Surgeons, and the defendent was represented by Dr. Commins.

John H. Bramley, a clerk, said that defendant carried on business at 2, Tulford Street, Liverpool, and over his premises was a sign which read, "Walsh's Veterinary Infirmary for Horses." This, Mr. Smith argued, was an infringement of the section, and would lead people to believe defendant was a qualified man. The Register was put in to prove that defendant's name was not on it, and reference was made to the decision in "Royal College of Veterinary Surgeons *v.* Robinson."

Dr. Commins, for the defence, contended that defendant had not infringed the Act at all, as he had not expressly stated that he was qualified. He also took objection to the authority to prosecute.

The bench overruled this objection, and convicted the defendant, but stated, as it was the first case in Liverpool, they would only fine him £2 and the court fees as costs.

**Two Thousand Cattle burned to Death.**—A terrible grass fire is reported from the Natal district, by which it is stated that 2000 head of cattle perished as well as several hundred sheep. It is said

the conflagration was caused by a mad Kaffir woman who had a mania for setting fire to everything she came across. The flames spread with terrific rapidity, and eventually reached a paddock of a large cattle-dealer, where about 2000 head of cattle were herded. The stock-dealer being away the animals could not be released, and being unable to escape from their confinement they all perished. Several hundred sheep in other places were also burnt to death.

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## BOOKS, ETC., RECEIVED.

*A Manual of Veterinary Physiology*, by Veterinary Captain F. Smith, M.R.C.V.S., Army Veterinary Department, &c.

*Roaring in Horses: its Pathology and Treatment*, by P. J. Cadiot, Professor at the Veterinary School, Alfort, translated by Thomas J. Watt Dollar, M.R.C.V.S.G.B., &c.

*Agricultural Journal published by the Department of Agriculture of the Cape Colony*, July and August, 1892.

*The Johns Hopkins Hospital Bulletin*, July-August, 1892.

*The Principal and most Efficacious Means of Preventing the Spread of Entozoal Affections in Man*, by Dr. Prospero Sousino, of Pisa.

*Proceedings of the Tenth General Meeting of the National Veterinary Association.*

*M. Pasteur's Double Hecatomb, the Tale of the Two Hundred and Thirty Dead.*

*Condensed Extracts*, Vol. i, No. 5, September (New York).

The following foreign publications are to hand:—*Annales de Médecine Vétérinaire*, Sept. and Oct.; *Oesterreichische Monatsschrift für Thierheilkunde, und Revue für Thierheilkunde und Thierzucht*, August, 1892; *Archivio per le Scienze Mediche, La Clinica Veterinaria* (Milan); *Zeitschrift für Veterinärkunde mit besonderer Berücksichtigung der Hygiene*, Berlin, Sept.; *La Presse Vétérinaire, paraissant à la Fin de chaque Mois*, August, 1892; and *Recueil de Médecine Vétérinaire, publié à l'École d'Alfort*, August, 1892.

Papers received: *Mark Lane Express, North British Agriculturist, The Field, Live Stock Journal, Bell's Weekly Messenger, Agricultural Gazette, Farmers' Gazette*, Dublin; *Isle of Wight Observer, Isle of Wight County Press, Edinburgh Evening Dispatch, The Montreal Herald, South of India Observer*, and *The Madras Mail.*

It is particularly requested that in future the British and Foreign Exchange Journals be directed to the Editors of the *Veterinarian*, 22½, Bartholomew Close, London, E.C.

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A Subscription of *twenty guineas* entitles the Subscriber to all the privileges of the Institution, as a general Veterinary Establishment and Hospital for animals, *for life;* and an annual payment of *two guineas*, to the same privileges during the continuance of such Subscription.

A Subscriber is entitled to have admitted into the Hospital for medical and surgical treatment an unlimited number of Horses or other animals, his own property, at a charge only for their keep. Also, without the payment of fees, to have the opinion of the Professors as to the treatment of any animal he may wish to retain in his own establishment.

A Subscriber has likewise the privilege of having *five horses* examined *as to soundness* in the course of the year *free of charge*, and to receive the opinion of the Professors thereon, either verbally or in writing. Also any additional number at a fee of ten shillings and sixpence for each *extra* horse, or to have ten horses examined on payment, in addition to his Annual Subscription of two guineas, of such other sum as shall from time to time be fixed by the Governing Body or General Purpose Committee. The Professors do not examine horses for soundness out of the Institution, nor do they visit patients, except on very special occasions, and then only with the object of their being removed into the Hospital for treatment.

Governors and Members of the Royal Agricultural Society have all the privileges of Subscribers, so far as they relate to the Animals of the Farm other than the Horse and Dog. They can also become Subscribers to the College on payment of one guinea annually. Veterinary Surgeons—former students of the College—have also the privilege of sending animals of any kind into the Infirmary for treatment.

# ROYAL VETERINARY COLLEGE.

**By the Royal Charter of Incorporation** the GOVERNORS have power "to confer upon and grant, to such of the Students of the said College as they shall think fit, *Annual or other Exhibitions, Scholarships, Medals and other Prizes and Certificates of Distinction.*"

A SCHOLARSHIP of £25 per annum, tenable for two years, was awarded for the year ending June 30th, 1891; and an additional Scholarship of the same amount will be awarded in 1892. A "CENTENARY" SCHOLARSHIP of the value of £21 will also be awarded annually. Beside the COLEMAN PRIZE MEDALS; CLASS MEDALS, PRIZES, and CERTIFICATES are given in each division of the Students' studies.

In addition to these Prizes the ROYAL AGRICULTURAL SOCIETY awards a *Silver* and a *Bronze Medal* to the two Students who may pass the best examination in the PATHOLOGY OF CATTLE, SHEEP, AND PIGS, at the DIPLOMA EXAMINATION OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

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The COLLEGE ENTRANCE FEE is *Sixty Guineas;* the payment of which confers the right of attendance on *all* the LECTURES AND COLLEGIATE INSTRUCTIONS. The fee may be paid in THREE instalments, viz., Twenty Guineas on *entry,* Twenty Guineas at the end of the *first period* of study, and Twenty Guineas at the *second period* of study—the first instalment must, with the Matriculation Examination Fee of One Guinea, as well as the Library and Reading Room Fee of One Guinea, be paid prior to this Examination.

A Pupil, previously to his admission, is required to produce a recognised Certificate of Educational Acquirements, which must include all the pass subjects of the Matriculation Examination, or otherwise he must pass an Examination in *Writing, Reading aloud, Dictation, English Grammar, English History or Geography, Arithmetic, and French, German, or Latin.* A Pupil may also elect to be examined in any of the following subjects, *not exceeding two:*—Euclid, Books one and two; Algebra to Quadratic Equations inclusive; Natural History (Botany, Geology, or Zoology); Physiology; Chemistry; Physics; and the Greek, German, or Italian Language.

The Educational Year is divided into a Winter and Summer Session of three terms, and begins on Oct. 1st and ends the middle of May.

Lectures, Clinical and Pathological, Demonstrations, and General Instruction, are given on Diseases of the Horse and other Domesticated Animals, including EPIZOÖTICS, PARASITES AND PARASITIC AFFECTIONS; ALSO ON BACTERIOLOGY, COMPARATIVE ANATOMY, PHYSIOLOGY, HISTOLOGY, CHEMISTRY (General and Practical), MATERIA MEDICA, TOXICOLOGY, BOTANY, THERAPEUTICS, AND PHARMACY; HOSPITAL PRACTICE, OBSTETRICS, OPERATIVE SURGERY, THE PRINCIPLES AND PRACTICE OF SHOEING, &c.

Besides these Lectures and Demonstrations, the facilities which exist in the INSTITUTION are such as to enable Pupils, by attention to their duties, to acquire a well-grounded practical knowledge of their profession, and thus, on obtaining their Diploma, to at once merit the confidence of the public. This will become fully apparent when it is remembered that, for several past years, upwards of 2000 animals have been annually prescribed for and treated as GRATUITOUS PATIENTS *by the Pupils under the Supervision of the Teachers.*

In addition to the practical knowledge thus to be obtained, the Pupils have the daily advantage of attending the Professors on their visits to the Patients in the Hospital, thereby becoming acquainted with the diagnosis and treatment of each individual case. Similar advantages are likewise enjoyed by them with reference to the Out-Patients. They also attend on the Professors in their Examinations of Horses for Soundness, the yearly average number of which exceeds 1000. It may be further added, as showing the advantage of the College for obtaining PRACTICAL KNOWLEDGE, that the number of animals admitted into the Hospital or treated as Out-Patients year by year exceeds 2000, or more than doubles those sent for examination as to soundness.

A Student, during his Academical Course, has to undergo THREE examinations by the Royal College of Veterinary Surgeons. To be eligible for the FIRST he is required to attend, *at least,* one Winter and one Summer Session; a second Winter and Summer Session before being eligible for the SECOND examination; and a third Winter and Summer Session before being examined for the Diploma of the College. The Examinations are held in May and December.

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